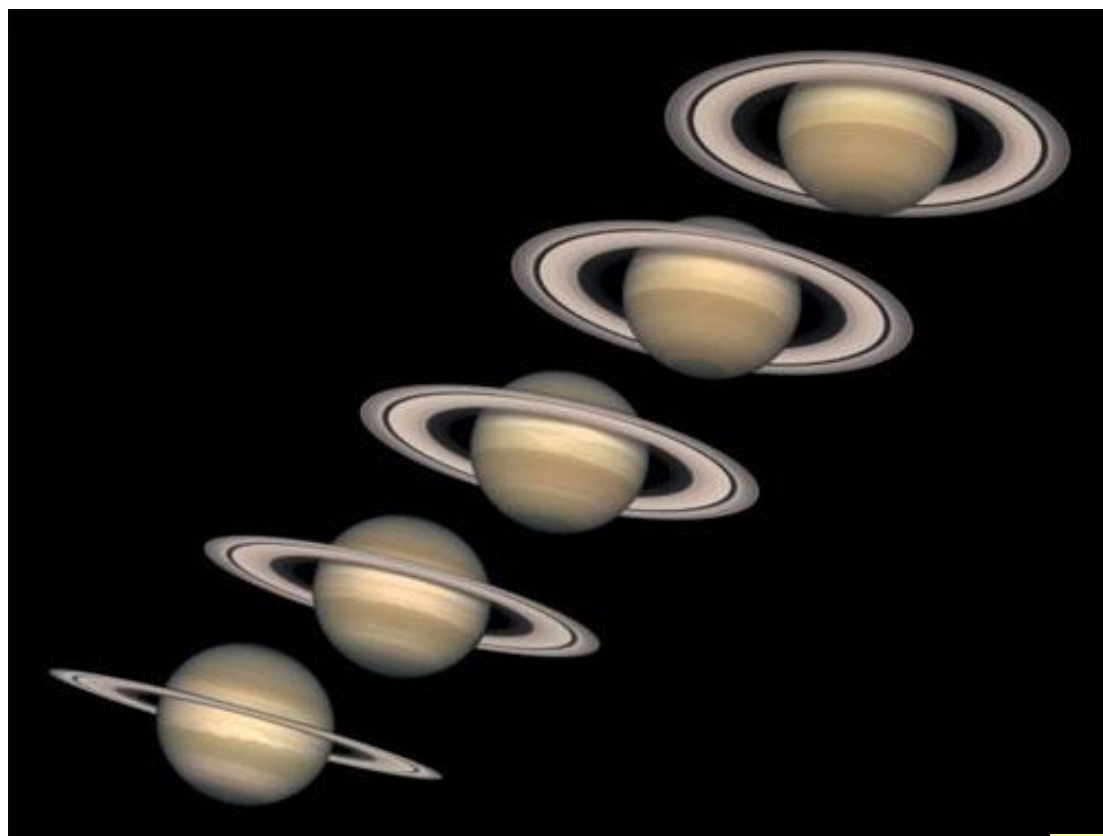


**ALMANACCO  
ASTRONOMICO  
ASTRONOMICAL  
ALMANAC  
2010**



**Pier Paolo Ricci**

**SPECIALE  
FENOMENI  
MUTUI**

**Questo Almanacco è il frutto di centinaia di ore di lavoro, la sua realizzazione ha richiesto infatti un anno intero.**

**Se il volume ti è piaciuto è gradita una donazione come contributo allo sviluppo di volumi futuri.  
Buona lettura.**

**Ricci Pier Paolo**

**IBAN IT17 D083 0534 4800 0000 0050 030**

**BIC CCRTIT2T77A**

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**This Almanac is the result of hundreds hours of job, its creation has required in fact one whole year.**

**If you like the volume it is pleasant a donation as contribution to the development of future volumes. Good reading.**

**Ricci Pier Paolo**

**IBAN IT17 D083 0534 4800 0000 0050 030**

**BIC CCRTIT2T77A**

# INTRODUZIONE - PREFACE

Questo anno l'Almanacco si presenta in una nuova veste, bilingue, con l'intento di permettere la consultazione ad un pubblico internazionale. Vista infatti la sua diffusione esclusivamente tramite il web si è reso necessario fondere le due versioni italiana ed inglese in una unica. La struttura delle tabelle è rimasta la stessa, così come i contenuti, seppur con qualche ampliamento e miglioria grafica.

I grandi eventi sono dettagliati adesso per tutte le maggiori città del mondo, ma pur sempre particolareggiati per l'Italia. Oltre 450 pagine per non perdere nessun evento, con dati ordinati in comode tabelle per ogni tipologia di fenomeno.

L'imponente mole di dati contenuta in questo Almanacco è rivolta a soddisfare tutte le necessità di chi osserva la volta celeste, tanto del professionista quanto dell'astrofilo. Vi sono inclusi sia i fenomeni che si renderanno visibili a occhio nudo, sia quelli notevoli per la spettacolarità e la rarità.

Oltre alle classiche effemeridi di Sole, pianeti e Luna, sono state prese in considerazione congiunzioni di ogni tipo, tra pianeti, con la Luna, con le comete, le posizioni dei satelliti di Giove e Saturno, i fenomeni mutui tra gli stessi, le eclissi solari e lunari, i raggruppamenti planetari e stellari, i prospetti di visibilità degli oggetti, le occultazioni lunari e asteroidali e tanto altro, il tutto corredato da grafici esplicativi e decine di pagine di informazioni varie.

È stato posto il massimo rigore nei calcoli e, salvo ove diversamente indicato, tutti i tempi sono espressi in Tempo Universale (TU): per avere i tempi segnati dai nostri orologi occorre ricordarsi pertanto di aggiungere un'ora in inverno e due ore in estate, quando è in vigore l'Ora Estiva. Generalmente gli eventi topocentrici sono espressi in TU, mentre quelli geocentrici in TDT. La differenza TDT-UT nel 2010 sarà di 67 secondi.

Talvolta sono stati inclusi anche eventi che iniziano o finiscono sotto l'orizzonte ma che si rendono visibili nel corso dei crepuscoli.

Le tabelle sono state create mediante l'utilizzo di software da me sviluppati o reperibili in Internet e tutti i dati sono aggiornatissimi. Per ulteriori aggiornamenti consultate il sito [www.pierpaoloricci.it](http://www.pierpaoloricci.it) o contattatemi alla mia email [almanacco.ricci@libero.it](mailto:almanacco.ricci@libero.it).

This year the Almanac is in a new style, bilanguage, with the intent to allow the consultation to an international public. In fact because its diffusion exclusively through the web it was necessary to melt the two versions Italian and English in one.

The structure of the charts has remained the same one as the contents, even though with some amplifications and graphic improvements.

The great events are detailed for the greatest cities of the world now. About 450 pages for any event, with orderly data in comfortable charts for every typology of phenomenon.

The massive structure of the data contained in this Almanac is turned to satisfy all the necessities of whom observes the sky, the professional or the amateur. They are included the phenomena that they will be visible by naked eye and those notable for the spectacularity and the rarity too. Besides the classical ephemerides of Sun, planets and Moon, they are data about conjunctions of every type, between planets, with the Moon, with the comets, the positions of the satellites of Jupiter and Saturn, the mutual phenomena between the same, the solar and lunar eclipses, the planetary and stellar groupings, the prospecta of visibility of the objects, the lunar and asteroidal occultations and so much other, all with many explanatory graphics.

The maximum precision has been set in the calculations and, except where otherwise suitable, every time is in Universal Time. Generally the events topocentric are in U.T., while those geocentric in TDT. The difference TDT-UT in 2010 will be 67 seconds. Sometimes they have also been included events that begin or end under the horizon but that they are visible during the twilights.

The charts are been created with softwares developed by me or available in Internet and all the data are updated. For further updatings consulted the site [www.pierpaoloricci.it](http://www.pierpaoloricci.it) or [www.pierpaoloricci.it/index\\_eng.htm](http://www.pierpaoloricci.it/index_eng.htm) or contacted me by email [almanacco.ricci@libero.it](mailto:almanacco.ricci@libero.it).

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Pierpaolo Ricci, sono laureato in ingegneria presso il Politecnico di Milano, sono appassionato di meccanica celeste ed ho scritto numerosi software per il calcolo di fenomeni astronomici di ogni tipo. Sono iscritto all'Associazione Astronomica di Rovereto (TN) e gestisco attivamente il mio sito di astronomia: [www.pierpaoloricci.it](http://www.pierpaoloricci.it)

In copertina : immagine di Saturno ripresa dal telescopio Hubble dal 1996 al 2000, foto NASA  
Courtesy NASA/JPL-Caltech

Pierpaolo Ricci is born in the '70 in Milan (Italy), he is graduated in mechanical engineering at Polytechnic and currently he lives in Rovereto (TN, Italy), where he works in a metalmeccanic industry. He is amateur of astronomy since the young age and he devoted his free time to the celestial mechanic writing numerous softwares for the calculation of phenomena of every type.

In the years 90 he take care of a scientific page on a monthly local magazine, writing articles about astronomy and astronautics.

Currently he collaborates for a local Astronomic Association and he manage an astronomical site, [www.pierpaoloricci.it](http://www.pierpaoloricci.it)

On the cover : Saturn Hubble Space Telescope images, captured from 1996 to 2000. Courtesy NASA/JPL-Caltech





Dedicato a Nadia,  
la stella più lucente  
del mio Universo

# CALENDARIO - CALENDAR

	Gen	Feb	Mar	Apr	Mag	Giu	Lug	Ago	Set	Ott	Nov	Dic
1	V	L	L	G	S	M	G	D	m	V	L	m
2	S	M	M	V	D	m	V	L	G	S	M	G
3	D	m	m	S	L	G	S	M	V	D	m	V
4	L	G	G	D	M	V	D	m	S	L	G	S
5	M	V	V	L	m	S	L	G	D	M	V	D
6	m	S	S	M	G	D	M	V	L	m	S	L
7	G	D	D	m	V	L	m	S	M	G	D	M
8	V	L	L	G	S	M	G	D	m	V	L	m
9	S	M	M	V	D	m	V	L	G	S	M	G
10	D	m	m	S	L	G	S	M	V	D	m	V
11	L	G	G	D	M	V	D	m	S	L	G	S
12	M	V	V	L	m	S	L	G	D	M	V	D
13	m	S	S	M	G	D	M	V	L	m	S	L
14	G	D	D	m	V	L	m	S	M	G	D	M
15	V	L	L	G	S	M	G	D	m	V	L	m
16	S	M	M	V	D	m	V	L	G	S	M	G
17	D	m	m	S	L	G	S	M	V	D	m	V
18	L	G	G	D	M	V	D	m	S	L	G	S
19	M	V	V	L	m	S	L	G	D	M	V	D
20	m	S	S	M	G	D	M	V	L	m	S	L
21	G	D	D	m	V	L	m	S	M	G	D	M
22	V	L	L	G	S	M	G	D	m	V	L	m
23	S	M	M	V	D	m	V	L	G	S	M	G
24	D	m	m	S	L	G	S	M	V	D	m	V
25	L	G	G	D	M	V	D	m	S	L	G	S
26	M	V	V	L	m	S	L	G	D	M	V	D
27	m	S	S	M	G	D	M	V	L	m	S	L
28	G	D	D	m	V	L	m	S	M	G	D	M
29	V		L	G	S	M	G	D	m	V	L	m
30	S		M	V	D	m	V	L	G	S	M	G
31	D		m		L		S	M		D		V

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	F	M	M	T	S	T	T	S	W	F	M	W
2	S	T	T	F	S	W	F	M	T	S	T	T
3	S	W	W	S	M	T	S	T	F	S	W	F
4	M	T	T	S	T	F	S	W	S	M	T	S
5	T	F	F	M	W	S	M	T	S	T	F	S
6	W	S	S	T	T	S	T	F	M	W	S	M
7	T	S	S	W	F	M	W	S	T	T	S	T
8	F	M	M	T	S	T	T	S	W	F	M	W
9	S	T	T	F	S	W	F	M	T	S	T	T
10	S	W	W	S	M	T	S	T	F	S	W	F
11	M	T	T	S	T	F	S	W	S	M	T	S
12	T	F	F	M	W	S	M	T	S	T	F	S
13	W	S	S	T	T	S	T	F	M	W	S	M
14	T	S	S	W	F	M	W	S	T	T	S	T
15	F	M	M	T	S	T	T	S	W	F	M	W
16	S	T	T	F	S	W	F	M	T	S	T	T
17	S	W	W	S	M	T	S	T	F	S	W	F
18	M	T	T	S	T	F	S	W	S	M	T	S
19	T	F	F	M	W	S	M	T	S	T	F	S
20	W	S	S	T	T	S	T	F	M	W	S	M
21	T	S	S	W	F	M	W	S	T	T	S	T
22	F	M	M	T	S	T	T	S	W	F	M	W
23	S	T	T	F	S	W	F	M	T	S	T	T
24	S	W	W	S	M	T	S	T	F	S	W	F
25	M	T	T	S	T	F	S	W	S	M	T	S
26	T	F	F	M	W	S	M	T	S	T	F	S
27	W	S	S	T	T	S	T	F	M	W	S	M
28	T	S	S	W	F	M	W	S	T	T	S	T
29	F		M	T	S	T	T	S	W	F	M	W
30	S		T	F	S	W	F	M	T	S	T	T
31	S		W		M		S	T		S		F

# PASQUA - EASTER

07/04/1901	20/04/1924	06/04/1947	29/03/1970	11/04/1993	27/03/2016	10/04/2039	26/03/2062	15/04/2085
30/03/1902	12/04/1925	28/03/1948	11/04/1971	03/04/1994	16/04/2017	01/04/2040	15/04/2063	31/03/2086
12/04/1903	04/04/1926	17/04/1949	02/04/1972	16/04/1995	01/04/2018	21/04/2041	06/04/2064	20/04/2087
03/04/1904	17/04/1927	09/04/1950	22/04/1973	07/04/1996	21/04/2019	06/04/2042	29/03/2065	11/04/2088
23/04/1905	08/04/1928	25/03/1951	14/04/1974	30/03/1997	12/04/2020	29/03/2043	11/04/2066	03/04/2089
15/04/1906	31/03/1929	13/04/1952	30/03/1975	12/04/1998	04/04/2021	17/04/2044	03/04/2067	16/04/2090
31/03/1907	20/04/1930	05/04/1953	18/04/1976	04/04/1999	17/04/2022	09/04/2045	22/04/2068	08/04/2091
19/04/1908	05/04/1931	18/04/1954	10/04/1977	23/04/2000	09/04/2023	25/03/2046	14/04/2069	30/03/2092
11/04/1909	27/03/1932	10/04/1955	26/03/1978	15/04/2001	31/03/2024	14/04/2047	30/03/2070	12/04/2093
27/03/1910	16/04/1933	01/04/1956	15/04/1979	31/03/2002	20/04/2025	05/04/2048	19/04/2071	04/04/2094
16/04/1911	01/04/1934	21/04/1957	06/04/1980	20/04/2003	05/04/2026	18/04/2049	10/04/2072	24/04/2095
07/04/1912	21/04/1935	06/04/1958	19/04/1981	11/04/2004	28/03/2027	10/04/2050	26/03/2073	15/04/2096
23/03/1913	12/04/1936	29/03/1959	11/04/1982	27/03/2005	16/04/2028	02/04/2051	15/04/2074	31/03/2097
12/04/1914	28/03/1937	17/04/1960	03/04/1983	16/04/2006	01/04/2029	21/04/2052	07/04/2075	20/04/2098
04/04/1915	17/04/1938	02/04/1961	22/04/1984	08/04/2007	21/04/2030	06/04/2053	19/04/2076	12/04/2099
23/04/1916	09/04/1939	22/04/1962	07/04/1985	23/03/2008	13/04/2031	29/03/2054	11/04/2077	28/03/2100
08/04/1917	24/03/1940	14/04/1963	30/03/1986	12/04/2009	28/03/2032	18/04/2055	03/04/2078	
31/03/1918	13/04/1941	29/03/1964	19/04/1987	04/04/2010	17/04/2033	02/04/2056	23/04/2079	
20/04/1919	05/04/1942	18/04/1965	03/04/1988	24/04/2011	09/04/2034	22/04/2057	07/04/2080	
04/04/1920	25/04/1943	10/04/1966	26/03/1989	08/04/2012	25/03/2035	14/04/2058	30/03/2081	
27/03/1921	09/04/1944	26/03/1967	15/04/1990	31/03/2013	13/04/2036	30/03/2059	19/04/2082	
16/04/1922	01/04/1945	14/04/1968	31/03/1991	20/04/2014	05/04/2037	18/04/2060	04/04/2083	
01/04/1923	21/04/1946	06/04/1969	19/04/1992	05/04/2015	25/04/2038	10/04/2061	26/03/2084	

# CALENDARIO PERPETUO - PERPETUAL CALENDAR

## SECOLO / CENTURY

0	100	200	300	400	500	600
700	800	900	1000	1100	1200	1300
1400	1500			1500	1600	
1700		1800		1900	2000	
2100		2200		2300	2400	
2500		2600		2700	2800	

## LETTERA DOMENICALE / SUNDAY CODE

## ANNI / YEARS

DC	ED	FE	GF	AG	BA	CB	00
B	C	D	E	F	G	A	01 29 57 85
A	B	C	D	E	F	G	02 30 58 86
G	A	B	C	D	E	F	03 31 59 87
FE	GF	AG	BA	CB	DC	ED	04 32 60 88
D	E	F	G	A	B	C	05 33 61 89
C	D	E	F	G	A	B	06 34 62 90
B	C	D	E	F	G	A	07 35 63 91
AG	BA	CB	DC	ED	FE	GF	08 36 64 92
F	G	A	B	C	D	E	09 37 65 93
E	F	G	A	B	C	D	10 38 66 94
D	E	F	G	A	B	C	11 39 67 95
CB	DC	ED	FE	GF	AG	BA	12 40 68 96
A	B	C	D	E	F	G	13 41 69 97
G	A	B	C	D	E	F	14 42 70 98
F	G	A	B	C	D	E	15 43 71 99
ED	FE	GF	AG	BA	CB	DC	16 44 72
C	D	E	F	G	A	B	17 45 73
B	C	D	E	F	G	A	18 46 74
A	B	C	D	E	F	G	19 47 75
GF	AG	BA	CB	DC	ED	FE	20 48 76
E	F	G	A	B	C	D	21 49 77
D	E	F	G	A	B	C	22 50 78
C	D	E	F	G	A	B	23 51 79
BA	CB	DC	ED	FE	GF	AG	24 52 80
G	A	B	C	D	E	F	25 53 81
F	G	A	B	C	D	E	26 54 82
E	F	G	A	B	C	D	27 55 83
DC	ED	FE	GF	AG	BA	CB	28 56 84

## MESE

gennaio, ottobre  
febbraio, marzo, novembre  
aprile, luglio  
maggio  
giugno  
agosto  
settembre, dicembre

A B C D E F G  
D E F G A B C  
G A B C D E F  
B C D E F G A  
E F G A B C D  
C D E F G A B  
F G A B C D E

## MONTHS

january, october  
february, march, november  
april, july  
may  
june  
august  
september, december

A B C D E F G  
D E F G A B C  
G A B C D E F  
B C D E F G A  
E F G A B C D  
C D E F G A B  
F G A B C D E

## DATA

1	8	15	22	29	D S V G m M L
2	9	16	23	30	L D S V G m M
3	10	17	24	31	M L D S V G m
4	11	18	25		m M L D S V G
5	12	19	26		G m M L D S V
6	13	20	27		V G m M L D S
7	14	21	28		S V G m M L D

## DAYS

1	8	15	22	29	S S F T W T M
2	9	16	23	30	M S S F T W T
3	10	17	24	31	T M S S F T W
4	11	18	25		W T M S S F T
5	12	19	26		T W T M S S F
6	13	20	27		F T W T M S S
7	14	21	28		S F T W T M S

Utilizzo: stabilita la data (per esempio 03-07-2010), trovare la lettera domenicale (per gli anni bisestili sono due, la prima da usarsi per i mesi di gennaio e febbraio, e la seconda per gli altri mesi) che è posta nel punto di incrocio fra la colonna del secolo che interessa (nel nostro caso 2000) e la riga in cui si trovano le ultime due cifre dell'anno che consideriamo (nel nostro caso 10): quindi C.

Per le date tra il 1500 e il 4-10-1582 si utilizza la seconda colonna, dove sta il 1500 del calendario giuliano, e per quelle dal 15-10-1582 al 1599 si utilizza la quinta colonna, dove sta il 1500 del calendario gregoriano.

Ricordo che i giorni che vanno dal 5 ottobre al 14 ottobre 1582 non sono mai esistiti.

Si cerca poi, nel settore dei mesi, in quale colonna la lettera appare sulla stessa linea orizzontale del mese considerato (luglio): nel nostro caso, nella quarta colonna. Infine, nella stessa colonna verticale (cioè la quarta), nel settore dei giorni, si individua il giorno della settimana che appare all'incrocio con la riga in cui sta il giorno del mese considerato (il 3): ed abbiamo che è S, sabato.

Si tenga presente che M (maiuscolo) sta per martedì ed m (minuscolo) sta per mercoledì.

How to use: set a date (for example 03-july-2010), find the Sunday code (in the leap years they are two, the first for january and february, and the second for the others months) in the cross of the column of the century (in this example 2000) and the row of the last two figures of the year (in this case 10): C.

In the dates since 1500 to 4-10-1582 we use the second column, for the julian calendar, since 15-10-1582 al 1599 we use the fourth column, for the Gregorian Calendar.

The days from 5 october to 14 october 1582 don't exist.

We look then, in the sector of the months, in what column the letter appears on the same horizontal line of the considered month (July): in our case, in the fourth column. Finally, in the same vertical column (the fourth), in the sector of the days, we individualize the day of the week that appears to the intersection with the line in which it is the day (3) of the considered month: and we have that it is S Saturday.

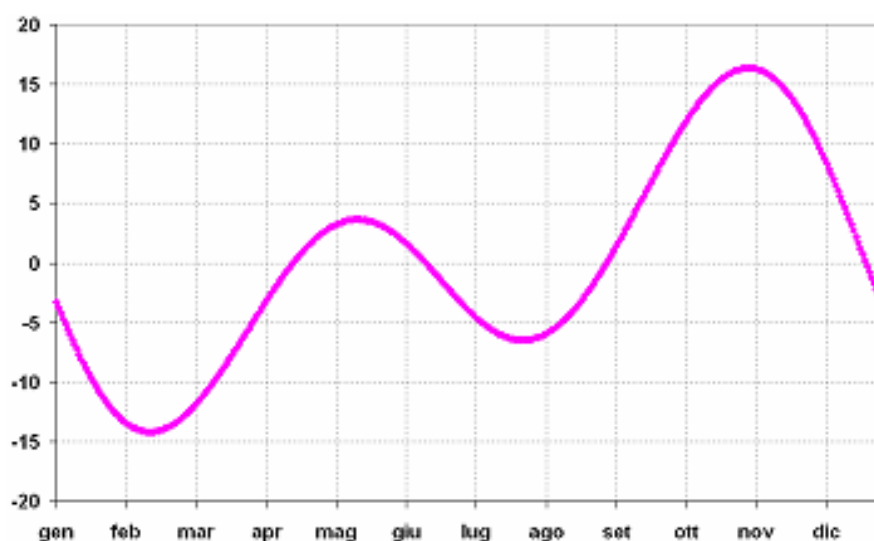
# EQUAZIONE DEL TEMPO – EQUATION OF TIME

L'equazione del tempo è la differenza tra il tempo solare vero e il tempo solare medio. E' espressa in minuti e secondi.

Tale differenza dipende dal fatto che il tempo solare medio è basato sul movimento di un Sole ipotetico (il Sole medio) che nel corso dell'anno si muove con moto uniforme lungo l'equatore celeste, mentre il moto annuo del Sole vero lungo l'eclittica non è uniforme.

The equation of the time is the difference between the true solar time and the medium solar time. It is showed in minutes and seconds. Such difference depends on the fact that the medium solar time is based on the movement of a hypothetical Sun (the medium Sun) that moves with uniform motion along the celestial equator during the year, while the annual motion of the true Sun along the ecliptica is not uniform.

	Gen/Jan	Feb	Mar	Apr	Mag/Maj	Giu/Jun	Lug/Jul	Ago/Aug	Set/Sep	Ott/Oct	Nov	Dic/Dec
1	-3m 40s	-13m 37s	-12m 19s	-3m 50s	2m 55s	2m 9s	-3m 54s	-6m 20s	0m 3s	10m 23s	16m 25s	10m 55s
2	-4m 8s	-13m 44s	-12m 7s	-3m 32s	3m 2s	2m 0s	-4m 5s	-6m 15s	0m 22s	10m 42s	16m 26s	10m 32s
3	-4m 36s	-13m 51s	-11m 54s	-3m 14s	3m 9s	1m 50s	-4m 16s	-6m 10s	0m 42s	11m 1s	16m 26s	10m 9s
4	-5m 3s	-13m 56s	-11m 41s	-2m 57s	3m 14s	1m 40s	-4m 27s	-6m 5s	1m 1s	11m 20s	16m 25s	9m 45s
5	-5m 30s	-14m 1s	-11m 28s	-2m 40s	3m 19s	1m 29s	-4m 37s	-5m 59s	1m 22s	11m 38s	16m 24s	9m 20s
6	-5m 56s	-14m 5s	-11m 14s	-2m 22s	3m 24s	1m 18s	-4m 47s	-5m 52s	1m 42s	11m 56s	16m 22s	8m 55s
7	-6m 22s	-14m 8s	-11m 0s	-2m 6s	3m 28s	1m 7s	-4m 57s	-5m 45s	2m 2s	12m 13s	16m 19s	8m 29s
8	-6m 47s	-14m 11s	-10m 45s	-1m 49s	3m 32s	0m 56s	-5m 6s	-5m 37s	2m 23s	12m 30s	16m 15s	8m 3s
9	-7m 12s	-14m 13s	-10m 30s	-1m 32s	3m 35s	0m 44s	-5m 15s	-5m 29s	2m 44s	12m 47s	16m 10s	7m 36s
10	-7m 36s	-14m 13s	-10m 14s	-1m 16s	3m 37s	0m 32s	-5m 23s	-5m 20s	3m 5s	13m 3s	16m 4s	7m 9s
11	-8m 0s	-14m 13s	-9m 59s	-1m 0s	3m 39s	0m 20s	-5m 31s	-5m 10s	3m 26s	13m 18s	15m 58s	6m 42s
12	-8m 23s	-14m 13s	-9m 42s	-0m 44s	3m 40s	0m 8s	-5m 39s	-5m 0s	3m 47s	13m 33s	15m 50s	6m 14s
13	-8m 46s	-14m 11s	-9m 26s	-0m 29s	3m 41s	-0m 4s	-5m 46s	-4m 49s	4m 8s	13m 48s	15m 42s	5m 46s
14	-9m 7s	-14m 9s	-9m 9s	-0m 14s	3m 41s	-0m 17s	-5m 53s	-4m 38s	4m 30s	14m 2s	15m 33s	5m 17s
15	-9m 29s	-14m 6s	-8m 53s	0m 1s	3m 40s	-0m 30s	-5m 59s	-4m 27s	4m 51s	14m 15s	15m 23s	4m 48s
16	-9m 49s	-14m 3s	-8m 36s	0m 15s	3m 39s	-0m 43s	-6m 5s	-4m 14s	5m 12s	14m 28s	15m 12s	4m 19s
17	-10m 9s	-13m 59s	-8m 18s	0m 29s	3m 37s	-0m 56s	-6m 10s	-4m 2s	5m 34s	14m 40s	15m 0s	3m 49s
18	-10m 28s	-13m 54s	-8m 1s	0m 42s	3m 35s	-1m 9s	-6m 14s	-3m 49s	5m 55s	14m 52s	14m 48s	3m 20s
19	-10m 47s	-13m 48s	-7m 43s	0m 55s	3m 32s	-1m 22s	-6m 19s	-3m 35s	6m 16s	15m 3s	14m 34s	2m 50s
20	-11m 4s	-13m 42s	-7m 26s	1m 8s	3m 29s	-1m 35s	-6m 22s	-3m 21s	6m 38s	15m 13s	14m 20s	2m 20s
21	-11m 21s	-13m 35s	-7m 8s	1m 20s	3m 25s	-1m 48s	-6m 25s	-3m 6s	6m 59s	15m 23s	14m 5s	1m 51s
22	-11m 38s	-13m 28s	-6m 50s	1m 32s	3m 21s	-2m 1s	-6m 28s	-2m 51s	7m 20s	15m 32s	13m 49s	1m 21s
23	-11m 53s	-13m 19s	-6m 32s	1m 43s	3m 16s	-2m 14s	-6m 30s	-2m 35s	7m 41s	15m 41s	13m 33s	0m 51s
24	-12m 8s	-13m 11s	-6m 14s	1m 54s	3m 10s	-2m 27s	-6m 31s	-2m 19s	8m 2s	15m 49s	13m 16s	0m 21s
25	-12m 22s	-13m 1s	-5m 56s	2m 4s	3m 4s	-2m 40s	-6m 32s	-2m 3s	8m 23s	15m 56s	12m 58s	-0m 9s
26	-12m 35s	-12m 52s	-5m 38s	2m 14s	2m 57s	-2m 53s	-6m 32s	-1m 46s	8m 43s	16m 2s	12m 39s	-0m 38s
27	-12m 47s	-12m 41s	-5m 20s	2m 23s	2m 50s	-3m 6s	-6m 31s	-1m 29s	9m 4s	16m 8s	12m 19s	-1m 8s
28	-12m 59s	-12m 30s	-5m 2s	2m 32s	2m 43s	-3m 18s	-6m 30s	-1m 11s	9m 24s	16m 13s	11m 59s	-1m 37s
29	-13m 10s		-4m 44s	2m 40s	2m 35s	-3m 30s	-6m 29s	-0m 53s	9m 44s	16m 17s	11m 38s	-2m 6s
30	-13m 19s		-4m 26s	2m 48s	2m 27s	-3m 42s	-6m 26s	-0m 35s	10m 4s	16m 20s	11m 17s	-2m 35s
31	-13m 28s		-4m 8s		2m 18s		-6m 23s	-0m 16s		16m 23s		-3m 4s



Esempio : il 3 luglio il Sole passa in meridiano alle 12.04 circa, ossia 5 minuti in ritardo rispetto al mezzogiorno del nostro orologio.

Example: on July 3 the Sun passes in meridian at 12.04 o'clock, 5 minutes late in comparison to the midday of our clock



# FUSI ORARI - TIME ZONES

UTC-12 : Isola Baker, Isola Howland

UTC-11 (BEST - Bering Standard Time) : Isole Midway ,Niue ,Samoa ,Samoa Americane

UTC-10 (HST - Hawaii-Aleutian Standard Time) : Atollo Johnston , Polinesia Francese (Tahiti, Arcipelago Tuamotu, Isole Tubuai) ,Stati Uniti (Hawaii) ,Stati Uniti (Isole Aleutine dell'Alaska)\*

UTC-9:30 : Polinesia Francese (Isole Marchesi)

UTC-9 (AKST - Alaska Standard Time) : Polinesia Francese (Isole Gambier) ,Stati Uniti (Alaska\*)

UTC-8 (PST - Pacific Standard Time) : Canada (Columbia Britannica\*, Yukon\*), Messico (Bassa California\*), Stati Uniti (California\*, Idaho (settentrionale)\*, Nevada\*, Oregon \*, Stato di Washington\*)

UTC-7 (MST - Mountain Standard Time) : Canada (Alberta\*,Territori del Nord-Ovest\*,Nunavut\*), Messico,Stati Uniti (Arizona, Colorado\*, Idaho (meridionale)\*, Montana\*, Nebraska (occidentale)\*, Nuovo Messico\*, Dakota del Nord\*, Oregon\*, Dakota del Sud\*, Utah\*, Wyoming\*)

UTC-6 (CST - Central Standard Time) : Belize , Canada (Manitoba\*, Nunavut (Isola Southampton), Nunavut (centrale)\*, Ontario (occidentale)\*, Saskatchewan) , Cile (Isola di Pasqua), Costa Rica , Ecuador (Isole Galapagos), El Salvador, Guatemala, Honduras, Messico\* (Città del Messico e tutti gli stati non menzionati), Nicaragua, Stati Uniti (Alabama\*, Arkansas\*, Illinois\*, Indiana\*, Iowa\*, Kansas\*, Kentucky (occidentale)\*, Louisiana\*, Minnesota\*, Mississippi\*, Missouri\*, Nebraska (orientale)\*, Dakota del Nord\*, Oklahoma\*, Dakota del Sud (orientale)\*, Tennessee centrale e occidentale)\*, Texas\*, Wisconsin\*)

UTC-5 (EST - Eastern Standard Time) : Brasile (Acre) ,Canada (Nunavut (orientale)\*, Ontario\*, Quebec\*), Colombia , Cuba\*, Ecuador, Giamaica, Haiti, Isole Cayman, Isole Turks e Caicos\* , Panamá, Perù, Stati Uniti (Connecticut\*, Delaware\*, Distretto di Columbia\*, Florida\*, Georgia\*, Indiana (gran parte dello stato), Kentucky (orientale e centrale)\*, Maine\*, Maryland\*, Massachusetts\*, Michigan\*, New Hampshire\*, New Jersey\*, New York\*, Carolina del Nord\*, Ohio\*, Pennsylvania\*, Rhode Island\*, Carolina del Sud\*, Tennessee (orientale)\*, Vermont\*, Virginia\*, Virginia Occidentale\*)

UTC-4 (AST - Atlantic Standard Time) : Anguilla , Antigua e Barbuda, Antille Olandesi, Aruba, Barbados, Bolivia, Brasile (Amazonas, Mato Grosso\*, Mato Grosso do Sul\*, Para (occidentale), Rondonia, Roraima), Canada (Labrador\*, New Brunswick\*, Nuova Scozia\*, Isola del Principe Edoardo\*) , Cile\*, Dominica, Grenada, Guadalupa , Guyana, Isole Falkland\*, Isole Vergini, Martinica, Montserrat, Paraguay\*, Porto Rico, Repubblica Dominicana, Saint Kitts e Nevis, Saint Vincent e le Grenadine, Santa Lucia, Trinidad e Tobago, Venezuela

UTC-3:30 (NST - Newfoundland Standard Time) : Canada (Terranova\*)

UTC-3 : Argentina ,Bahamas\* ,Brasile (Alagoas, Amapa, Bahia\*, Ceara, Distrito Federal\*, Espirito Santo\*, Goias\*, Maranhao, Minas Gerais\*, Para (orientale), Paraiba, Parana\*, Pernambuco, Piaui, Rio de Janeiro\*, Rio Grande do Norte, Rio Grande do Sul\*, Santa Catarina\*, Sao Paulo\*, Sergipe, Tocantins\*) ,Groenlandia, Guiana Francese\* ,Saint Pierre e Miquelon\* ,Suriname ,Uruguay

UTC-2 : Bermuda\* , Brasile (Fernando de Noronha)

UTC-1 : Capo Verde , Portogallo (Azzorre\*)

UTC (WET - West European Time) : Burkina Faso , Costa d'Avorio , Gambia ,Ghana ,Guinea ,Guinea-Bissau , Irlanda\* , Islanda ,Isole Faroe\* ,Liberia ,Mali ,Mauritania ,Marocco ,Portogallo\* ,Regno Unito\* , Sant'Elena ,São Tomé e Príncipe ,Senegal ,Sierra Leone ,Spagna\* (Canarie) ,Togo

UTC+1 (CET - Central European Time) : Albania\* ,Andorra\* ,Angola ,Austria\* ,Belgio\* ,Benin ,Bosnia-Erzegovina\* ,Camerun ,Ciad ,Croazia\* ,Danimarca\* ,Francia\* ,Gabon ,Germania\* ,Gibilterra\* ,Guinea Equatoriale ,Italia\* ,Isole Svalbard e Jan Mayen\*,Liechtenstein\* ,Lussemburgo\* ,Macedonia\* , Malta\* Principato di Monaco\*,Montenegro\*,Namibia\*, Niger ,Nigeria ,Norvegia\*,Paesi Bassi\*, Polonia\*, Repubblica Ceca\* ,Repubblica Centrafricana ,Repubblica del Congo ,Repubblica Democratica del Congo (Kinshasa, Bandundu, Bas-Congo, Équateur) ,San Marino\* ,Serbia\* ,Slovacchia\* ,Slovenia\* ,Spagna\*, Svezia\*, Svizzera\* ,Tunisia\* ,Ungheria\*

UTC+2 (EET - East European Time) : Bielorussia\* ,Botswana ,Bulgaria\* ,Burundi ,Cipro\* ,Cisgiordania\* , Egitto\* ,Estonia\* ,Finlandia\* ,Giordania ,Grecia\* ,Israele\* ,Lettonia\* ,Lesotho ,Libano\* ,Libia ,Lituania\* Malawi ,Moldavia\* ,Mozambico ,Repubblica Democratica del Congo (Kasai-Occidental, Kasai-Oriental, Alto Zaire, Katanga) ,Romania\* ,Russia (Zona 1\*, compresa Kaliningrad) ,Ruanda ,Striscia di Gaza\* ,Sudafrica , Swaziland ,Siria\* ,Turchia\* ,Ucraina\* ,Zambia ,Zimbabwe

UTC+3 (MSK - Moscow Time) : Arabia Saudita , Bahrain , Comore ,Eritrea ,Etiopia ,Gibuti ,Iraq\* ,Kenya , Kuwait ,Madagascar ,Mayotte ,Qatar ,Russia (Zona 2\*, include Mosca e San Pietroburgo; questo fuso orario si applica anche alle ferrovie di tutta la Russia) ,Somalia ,Sudan ,Tanzania ,Uganda ,Yemen

UTC+3:30 : Iran

UTC+4 : Emirati Arabi Uniti , Georgia , Mauritius , Oman ,Reunion ,Russia (Zona 3\*) ,Seychelles

UTC+4:30 : Afghanistan

UTC+5 : Armenia , Azerbaigian\* ,Kazakistan (Occidentale)\* ,Maldive ,Pakistan ,Russia (Zona 4\*, comprende Ekaterinburg e Perm) ,Tagikistan ,Turkmenistan ,Uzbekistan

UTC+5:30 (IST - Indian Standard Time) : India ,Sri Lanka

UTC+5:45 : Nepal

UTC+6 : Bangladesh ,Bhutan ,Kazakistan (orientale) ,Kirghizistan ,Russia (Zona 5\*, comprende Novosibirsk e Omsk) ,Sri Lanka

UTC+6:30 : Isole Cocos , Myanmar

UTC+7 : Cambogia ,Indonesia (occidentale) ,Isola Christmas (Australia) ,Laos ,Russia (Zona 6\*) ,Thailandia ,Vietnam

UTC+8 (AWST - Australian Western Standard Time) : Australia (Australia Occidentale) ,Brunei ,Cina (continentale),Filippine ,Hong Kong ,Indonesia (centrale),Macao ,Malesia ,Mongolia ,Russia (Zona 7\*),Singapore, Taiwan

Si noti che l'intera Cina ha lo stesso orario, il che rende questo fuso orario eccezionalmente ampio. All'estremità occidentale della Cina il Sole raggiunge lo zenit alle 15:00, all'estremità orientale alle 11:00.

UTC+8:45 : Caiguna, Eucla (Australia Occidentale)

UTC+9 : Corea del Nord ,Corea del Sud (KST - tempo standard della Corea) ,Giappone (JST - Tempo standard del Giappone) ,Indonesia (orientale) ,Palau ,Russia (Zona 8\*, comprende Yakutsk) ,Timor Est

UTC+9:30 (ACST - Australian Central Standard Time) : Australia (Broken Hill (Nuovo Galles del Sud); Territori del Nord; Australia Meridionale\*)

UTC+10 (AEST - Australian Eastern Standard Time) : Australia (Australian Capital Territory\*, Nuovo Galles del Sud\* (eccetto Broken Hill), Queensland, Victoria\*, Tasmania\*) ,Guam ,Isole Cook ,Isole Marianne Settentrionali, Papua Nuova Guinea ,Russia (Zona 9\*, comprende Vladivostok) ,Stati Federati di Micronesia

UTC+10:30 : Australia (Isola Lord Howe\*) (DST solo 0:30)

UTC+11 : Isole Salomone ,Nuova Caledonia ,Russia (Zona 10\*) ,Stati Federati di Micronesia (Kosrae e Pohnpei), Vanuatu

UTC+11:30 : Isole Norfolk

UTC+12 : Figi\* ,Isola Wake ,Isole Marshall ,Kiribati (Isole Gilbert) ,Nauru ,Nuova Zelanda (Aotearoa)\* , Russia (Zona 11\*) ,Tuvalu ,Wallis e Futuna

UTC+12:45 : Nuova Zelanda (Aotearoa) (Isole Chatham\*)

UTC+13 : Kiribati (Isole Phoenix) , Tonga

UTC+14 : Kiribati (Isole della Linea o Sporadi equatoriali)

Gli stati che riportano l'asterisco \* adottano l'ora legale in estate

\* daylight saving time in the summer

## ORA LEGALE - DAYLIGHT SAVING

Anno	Inizio		Fine	
2009	Dalle ore 2 del	29 marzo	Alle ore 3 del	25 ottobre
2010	"	28 marzo	"	31 ottobre
2011	"	27 marzo	"	30 ottobre

U.S. Daylight Saving Time

Year	Start	End
2010	2 a.m. March 14	2 a.m. Nov. 7
2011	2 a.m. March 13	2 a.m. Nov. 6

# TEMPO SIDERALE – SIDEREAL TIME

Tempo sidérale per Roma – Sidereal time for Rome

Greenwich Apparent										Sidereal Times Mean										Local Apparent										Greenwich Apparent										Sidereal Times Mean										Local Apparent																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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2455197.5	2010-01-	1	6	42	10.0363	6	42	09.0306	7	30	10.0363	2455299.5	2010-04-13	13	24	18.6267	13	24	17.6782	14	12	18.6267	2455300.5	2010-04-14	13	28	15.1746	13	28	14.2336	14	16	15.1746	2455301.5	2010-04-15	13	32	11.7244	13	32	10.7889	14	20	11.7244	2455302.5	2010-04-16	13	36	08.2771	13	36	07.3443	14	24	08.2771	2455303.5	2010-04-17	13	40	04.8330	13	40	03.8997	14	28	04.8330	2455304.5	2010-04-18	13	44	01.3919	13	44	00.4550	14	32	01.3919	2455305.5	2010-04-19	13	47	57.9530	13	47	57.0104	14	35	57.9530	2455306.5	2010-04-20	13	51	54.5147	13	51	53.5658	14	39	54.5147	2455307.5	2010-04-21	13	55	51.0754	13	55	50.1212	14	43	51.0754	2455308.5	2010-04-22	13	59	47.6337	13	59	46.6765	14	47	47.6337	2455309.5	2010-04-23	14	03	44.1886	14	03	43.2319	14	51	44.1886	2455310.5	2010-04-24	14	07	40.7399	14	07	39.7873	14	55	40.7399	2455311.5	2010-04-25	14	11	37.2886	14	11	36.3426	14	59	37.2886	2455312.5	2010-04-26	14	15	33.8364	14	15	32.8980	15	03	33.8364	2455313.5	2010-04-27	14	19	30.3851	14	19	29.4534	15	07	30.3851	2455314.5	2010-04-28	14	23	26.9363	14	23	26.0087	15	11	26.9363	2455315.5	2010-04-29	14	27	23.4910	14	27	22.5641	15	15	23.4910	2455316.5	2010-04-30	14	31	20.0490	14	31	19.1195	15	19	20.0490	2455317.5	2010-05- 1	14	35	16.6093	14	35	15.6748	15	23	16.6093	2455318.5	2010-05- 2	14	39	13.1706	14	39	12.2302	15	27	13.1706	2455319.5	2010-05- 3	14	43	09.7317	14	43	08.7856	15	31	09.7317	2455320.5	2010-05- 4	14	47	06.2915	14	47	05.3409	15	35	06.2915	2455321.5	2010-05- 5	14	51	02.8492	14	51	01.8963	15	39	02.8492	2455322.5	2010-05- 6	14	54	59.4045	14	54	58.4517	15	42	59.4045	2455323.5	2010-05- 7	14	58	55.9574	14	58	55.0070	15	46	55.9574	2455324.5	2010-05- 8	15	02	52.5084	15	02	51.5624	15	50	52.5084	2455325.5	2010-05- 9	15	06	49.0580	15	06	48.1178	15	54	49.0580	2455326.5	2010-05-10	15	10	45.6072	15	10	44.6732	15	58	45.6072	2455327.5	2010-05-11	15	14	42.1569	15	14	41.2285	16	02	42.1569	2455328.5	2010-05-12	15	18	38.7083	15	18	37.7839	16	06	38.7083	2455329.5	2010-05-13	15	22	35.2624	15	22	34.3393	16	10	35.2624	2455330.5	2010-05-14	15	26	31.8198	15	26	30.8946	16	14	31.8198	2455331.5	2010-05-15	15	30	28.3804	15	30	27.4500	16	18	28.3804	2455332.5	2010-05-16	15	34	24.9436	15	34	24.0054	16	22	24.9436	2455333.5	2010-05-17	15	38	21.5079	15	38	20.5607	16	26	21.5079	2455334.5	2010-05-18	15	42	18.0716	15	42	17.1161	16	30	18.0716	2455335.5	2010-05-19	15	46	14.6329	15	46	13.6715	16	34	14.6329	2455336.5	2010-05-20	15	50	11.1908	15	50	10.2268	16	38	11.1908	2455337.5	2010-05-21	15	54	07.7452	15	54	06.7822	16	42	07.7452	2455338.5	2010-05-22	15	58	04.2966	15	58	03.3376	16	46	04.2966	2455339.5	2010-05-23	16	02	00.8468	16	01	59.8929	16	50	00.8468	2455340.5	2010-05-24	16	05	57.3973	16	05	56.4483	16	53	57.3973	2455341.5	2010-05-25	16	09	53.9499	16	09	53.0037	16	57	53.9499	2455342.5	2010-05-26	16	13	50.5056	16	13	49.5590	17	01	50.5056	2455343.5	2010-05-27	16	17	47.0646	16	17	46.1144	17	05	47.0646	2455344.5	2010-05-28	16	21	43.6262	16	21	42.6698	17	09	43.6262	2455345.5	2010-05-29	16	25	40.1894	16	25	39.2252	17	13	40.1894	2455346.5	2010-05-30	16	29	36.7529	16	29	35.7805	17	17	36.7529	2455347.5	2010-05-31	16	33	33.3154	16	33	32.3359	17	21	33.3154	2455348.5	2010-06- 1	16	37	29.8760	16	37	28.8913	17	25	29.8760	2455349.5	2010-06- 2	16	41	26.4342	16	41	25.4466	17	29	26.4342	2455350.5	2010-06- 3	16	45	22.9899	16	45	22.0020	17	33	22.9899	2455351.5	2010-06- 4	16	49	19.5435	16	49	18.5574	17	37	19.5435	2455352.5	2010-06- 5	16	53	16.0954	16	53	15.1127	17	41	16.0954	2455353.5	2010-06- 6	16	57	12.6465	16	57	11.6681	17	45	12.6465	2455354.5	2010-06- 7	17	01	09.1978	17	01	08.2235	17	49	09.1978	2455355.5	2010-06- 8	17	05	05.7503	17	05	04.7788	17	53	05.7503	2455356.5	2010-06- 9	17	09	02.3051	17	09	01.3342	17	57	02.3051	2455357.5	2010-06-10	17	12	58.8629	17	12	57.8896	18	00	58.8629	2455358.5	2010-06-11	17	16	55.4242	17	16	54.4449	18	04	55.4242	2455359.5	2010-06-12	17	20	51.9884	17	20	51.0003	18	08	51.9884	2455360.5	2010-06-13	17	24	48.5545	17	24	47.5557	18	12	48.5545	2455361.5	2010-06-14	17	28	45.1205	17	28	44.1111	18	16	45.1205	2455362.5	2010-06-15	17	32	41.6845	17	32	40.6664	18	20	41.6845	2455363.5	2010-06-16	17	36	38.2450	17	36	37.2218	18	24	38.2450	2455364.5	2010-06-17	17	40	34.8016	17	40	33.7722	18	28	34.8016	2455365.5	2010-06-18	17	44	31.3549	17	44	30.3325	18	32	31.3549	2455366.5	2010-06-19	17	48	27.9064	17	48	26.8879	18	36	27.9064	2455367.5	2010-06-20	17	52	24.4578	17	52	23.4333	18	40	24.4578	2455368.5	2010-06-21	17	56	21.0108	17	56	19.9986	18	44	21.0108	2455369.5	2010-06-22	18	00	17.5666	18	00	16.5540	18	48	17.5666	2455370.5	2010-06-23	18	04	14.1255	18	04	13.1094	18	52	14.1255	2455371.5	2010-06-24	18	08	10.6871	18	08	09.6647	18	56	10.6871	2455372.5	2010-06-25	18	12	07.2505	18	12	06.2201	19	00	07.2505	2455373.5	2010-06-26	18	16	03.8145	18	16	02.7755	19	04	03.8145	2455374.5	2010-06-27	18	20	00.3779	18	19	59.3308	19	08	00.3779	2455375.5	2010-06-28	18	23	56.9397	18	23	55.8862	19	11	56.9397	2455376.5	2010-06-29	18	27	53.4991	18	27	52.4416	19	15	53.4991	2455377.5	2010-06-30	18	31	50.0560	18	31	48.9969	19	19	50.0560	2455378.5	2010-07- 1	18	35	46.6105	18	35	45.5523	19	23	46.6105	2455379.5	2010-07- 2	18	39	43.1631	18	39	42.1077	19	27	43.1631	2455380.5	2010-07- 3	18	43	39.7145	18	43	38.6631	19	31	39.7145	2455381.5	2010-07- 4	18	47	36.2657	18	47	35.2184	19	35	36.2657	2455382.5	2010-07- 5	18	51	32.8177	18	51	31.7738	19	39	32.8177	2455383.5	2010-07- 6	18	55	29.3714	18	55	28.3292	19	43	29.3714	2455384.5	2010-07- 7	18	59	25.9279	18	59	24.8845	19	47	25.9279	2455385.5	2010-07- 8	19	03	22.4875	19	03	21.4399	19	51	22.4875	2455386.5	2010-07- 9	19	07	19.0503	19	07	17.9953	19	55	19.0503	2455387.5	2010-07-10	19	11	15.6154	19	11	14.5506	19	



Greenwich Sidereal Times										Greenwich Sidereal Times											
Julian date		Apparent			Mean			Local Apparent			Julian date		Apparent			Mean			Local Apparent		
Year	Mon	Da	h	m	s	h	m	s	h	m	s	Year	Mon	Da	h	m	s	h	m	s	
2455401.5	2010-07-24	20	06	27.4299	20	06	26.3258	20	54	27.4299	2455482.5	2010-10-13	1	25	48.2994	1	25	47.3106	2	13	48.2994
2455402.5	2010-07-25	20	10	23.9907	20	10	22.8812	20	58	23.9907	2455483.5	2010-10-14	1	29	44.8585	1	29	43.8660	2	17	44.8585
2455403.5	2010-07-26	20	14	20.5493	20	14	19.4365	21	02	20.5493	2455484.5	2010-10-15	1	33	41.4159	1	33	40.4214	2	21	41.4159
2455404.5	2010-07-27	20	18	17.1053	20	18	15.9919	21	06	17.1053	2455485.5	2010-10-16	1	37	37.9711	1	37	36.9767	2	25	37.9711
2455405.5	2010-07-28	20	22	13.6589	20	22	12.5473	21	10	13.6589	2455486.5	2010-10-17	1	41	34.5237	1	41	33.5321	2	29	34.5237
2455406.5	2010-07-29	20	26	10.2104	20	26	09.1026	21	14	10.2104	2455487.5	2010-10-18	1	45	31.0741	1	45	30.0875	2	33	31.0741
2455407.5	2010-07-30	20	30	06.7604	20	30	05.6580	21	18	06.7604	2455488.5	2010-10-19	1	49	27.6227	1	49	26.6428	2	37	27.6227
2455408.5	2010-07-31	20	34	03.3098	20	34	02.2134	21	22	03.3098	2455489.5	2010-10-20	1	53	24.1702	1	53	23.1982	2	41	24.1702
2455409.5	2010-08- 1	20	37	59.8597	20	37	58.7687	21	25	59.8597	2455490.5	2010-10-21	1	57	20.7175	1	57	19.7536	2	45	20.7175
2455410.5	2010-08- 2	20	41	56.4110	20	41	55.3241	21	29	56.4110	2455491.5	2010-10-22	2	01	17.2656	2	01	16.3089	2	49	17.2656
2455411.5	2010-08- 3	20	45	52.9644	20	45	51.8795	21	33	52.9644	2455492.5	2010-10-23	2	05	13.8155	2	05	12.8643	2	53	13.8155
2455412.5	2010-08- 4	20	49	49.5208	20	49	48.4348	21	37	49.5208	2455493.5	2010-10-24	2	09	10.3678	2	09	09.4197	2	57	10.3678
2455413.5	2010-08- 5	20	53	46.0801	20	53	44.9902	21	41	46.0801	2455494.5	2010-10-25	2	13	06.9230	2	13	05.9751	3	01	06.9230
2455414.5	2010-08- 6	20	57	42.6421	20	57	41.5456	21	45	42.6421	2455495.5	2010-10-26	2	17	03.4809	2	17	02.5304	3	05	03.4809
2455415.5	2010-08- 7	21	01	39.2056	21	01	38.1009	21	49	39.2056	2455496.5	2010-10-27	2	21	00.0410	2	20	59.0858	3	09	00.0410
2455416.5	2010-08- 8	21	05	35.7690	21	05	34.6563	21	53	35.7690	2455497.5	2010-10-28	2	24	56.6021	2	24	55.6412	3	12	56.6021
2455417.5	2010-08- 9	21	09	32.3302	21	09	31.2117	21	57	32.3302	2455498.5	2010-10-29	2	28	53.1629	2	28	52.1965	3	16	53.1629
2455418.5	2010-08-10	21	13	28.8877	21	13	27.7671	22	01	28.8877	2455499.5	2010-10-30	2	32	49.7220	2	32	48.7519	3	20	49.7220
2455419.5	2010-08-11	21	17	25.4408	21	17	24.3224	22	05	25.4408	2455500.5	2010-10-31	2	36	46.2783	2	36	45.3073	3	24	46.2783
2455420.5	2010-08-12	21	21	21.9904	21	21	20.8778	22	09	21.9904	2455501.5	2010-11- 1	2	40	42.8312	2	40	41.8626	3	28	42.8312
2455421.5	2010-08-13	21	25	18.5385	21	25	17.4332	22	13	18.5385	2455502.5	2010-11- 2	2	44	39.3812	2	44	38.4180	3	32	39.3812
2455422.5	2010-08-14	21	29	15.0873	21	29	13.9885	22	17	15.0873	2455503.5	2010-11- 3	2	48	35.9297	2	48	34.9734	3	36	35.9297
2455423.5	2010-08-15	21	33	11.6385	21	33	10.5439	22	21	11.6385	2455504.5	2010-11- 4	2	52	32.4784	2	52	31.5287	3	40	32.4784
2455424.5	2010-08-16	21	37	08.1928	21	37	07.0993	22	25	08.1928	2455505.5	2010-11- 5	2	56	29.0293	2	56	28.0841	3	44	29.0293
2455425.5	2010-08-17	21	41	04.7500	21	41	03.6546	22	29	04.7500	2455506.5	2010-11- 6	3	00	25.5837	3	00	24.6395	3	48	25.5837
2455426.5	2010-08-18	21	45	01.3093	21	45	00.2100	22	33	01.3093	2455507.5	2010-11- 7	3	04	22.1418	3	04	21.1948	3	52	22.1418
2455427.5	2010-08-19	21	48	57.8695	21	48	56.7654	22	36	57.8695	2455508.5	2010-11- 8	3	08	18.7028	3	08	17.7502	3	56	18.7028
2455428.5	2010-08-20	21	52	54.4296	21	52	53.3207	22	40	54.4296	2455509.5	2010-11- 9	3	12	15.2653	3	12	14.3056	4	00	15.2653
2455429.5	2010-08-21	21	56	50.9885	21	56	49.8761	22	44	50.9885	2455510.5	2010-11-10	3	16	11.8276	3	16	10.8609	4	04	11.8276
2455430.5	2010-08-22	22	00	47.5453	22	00	46.4315	22	48	47.5453	2455511.5	2010-11-11	3	20	08.3884	3	20	07.4163	4	08	08.3884
2455431.5	2010-08-23	22	04	44.0997	22	04	42.9868	22	52	44.0997	2455512.5	2010-11-12	3	24	04.9470	3	24	03.9717	4	12	04.9470
2455432.5	2010-08-24	22	08	40.6515	22	08	39.5422	22	56	40.6515	2455513.5	2010-11-13	3	28	01.5031	3	28	00.5271	4	16	01.5031
2455433.5	2010-08-25	22	12	37.2011	22	12	36.0976	23	00	37.2011	2455514.5	2010-11-14	3	31	58.0567	3	31	57.0824	4	19	58.0567
2455434.5	2010-08-26	22	16	33.7492	22	16	32.6529	23	04	33.7492	2455515.5	2010-11-15	3	35	54.6083	3	35	53.6378	4	23	54.6083
2455435.5	2010-08-27	22	20	30.2964	22	20	29.2083	23	08	30.2964	2455516.5	2010-11-16	3	39	51.1586	3	39	50.1932	4	27	51.1586
2455436.5	2010-08-28	22	24	26.8438	22	24	25.7637	23	12	26.8438	2455517.5	2010-11-17	3	43	47.7085	3	43	46.7485	4	31	47.7085
2455437.5	2010-08-29	22	28	23.3924	22	28	22.3191	23	16	23.3924	2455518.5	2010-11-18	3	47	44.2589	3	47	43.3039	4	35	44.2589
2455438.5	2010-08-30	22	32	19.9429	22	32	18.8744	23	20	19.9429	2455519.5	2010-11-19	3	51	40.8108	3	51	39.8593	4	39	40.8108
2455439.5	2010-08-31	22	36	16.4960	22	36	15.4298	23	24	16.4960	2455520.5	2010-11-20	3	55	37.3650	3	55	36.4146	4	43	37.3650
2455440.5	2010-09- 1	22	40	13.0519	22	40	11.9852	23	28	13.0519	2455521.5	2010-11-21	3	59	33.9221	3	59	32.9700	4	47	33.9221
2455441.5	2010-09- 2	22	44	09.6104	22	44	08.5405	23	32	09.6104	2455522.5	2010-11-22	4	03	30.4821	4	03	29.5254	4	51	30.4821
2455442.5	2010-09- 3	22	48	06.1708	22	48	05.0959	23	36	06.1708	2455523.5	2010-11-23	4	07	27.0446	4	07	26.0807	4	55	27.0446
2455443.5	2010-09- 4	22	52	02.7317	22	52	01.6513	23	40	02.7317	2455524.5	2010-11-24	4	11	23.6085	4	11	22.6361	4	59	23.6085
2455444.5	2010-09- 5	22	55	59.2914	22	55	58.2066	23	43	59.2914	2455525.5	2010-11-25	4	15	20.1724	4	15	19.1915	5	03	20.1724
2455445.5	2010-09- 6	22	59	55.8483	22	59	54.7620	23	47	55.8483	2455526.5	2010-11-26	4	19	16.7347	4	19	15.7468	5	07	16.7347
2455446.5	2010-09- 7	23	03	52.4012	23	03	51.3174	23	51	52.4012	2455527.5	2010-11-27	4	23	13.2942	4	23	12.3022	5	11	13.2942
2455447.5	2010-09- 8	23	07	48.9502	23	07	47.8727	23	55	48.9502	2455528.5	2010-11-28	4	27	09.8504	4	27	08.8576	5	15	09.8504
2455448.5	2010-09- 9	23	11	45.4968	23	11	44.4281	23	59	45.4968	2455529.5										

# CALENDARIO GENERALE EVENTI

## GENERAL CALENDAR OF EVENTS

gennaio			
d	h	d	h
1	20	15	19
3	2	17	1
4	2	17	20
4	18	18	6
5	11	20	6
7	10	23	10
7	23	26	20
11	13	27	8
11	21	27	19
12	8	29	19
13	16	30	6
14	18	30	8
15	7	31	13
15	9		

febbraio			
d	h	d	h
4	6	15	1
5	23	16	14
7	19	17	2
8	5	22	0
8	14	23	5
12	4	26	3
13	1	27	13
14	2	27	20
14	4	28	0
14	20	28	10
14	23	28	16

marzo			
d	h	d	h
3	16	15	21
4	4	15	23
7	2	17	6
7	15	20	17
7	21	22	0
8	1	22	11
11	9	23	10
12	10	25	12
13	12	27	10
14	12	28	4
14	21	30	2
15	21	31	2

aprile			
d	h	d	h
3	11	16	10
4	5	18	13
6	9	18	17
7	0	21	18
8	23	22	7
9	3	23	18
9	21	24	20
11	17	27	12
12	9	28	12
14	12	28	16
15	21	30	20

maggio			
d	h	d	h
1	14	20	8
2	20	20	8
6	4	20	23
6	22	20	23
7	6	24	19
9	12	26	3
9	20	27	23
11	0	28	5
14	1	28	22
15	23	30	3
16	10	31	16

giugno			
d	h	d	h
1	1	15	17
3	14	17	5
3	17	17	14
4	22	19	4
6	6	21	1
7	4	21	11
8	12	24	12
8	17	25	5
11	0	25	18
12	7	26	10
12	11	26	11
15	5	28	12
15	15	30	22

luglio			
d	h	d	h
1	9	16	0
3	14	18	7
4	14	18	10
6	0	21	18
6	8	22	11
6	10	23	15
9	16	24	3
10	11	26	1
11	19	27	21
12	22	28	3
13	11	28	23
14	13	30	21
14	21	31	8

agosto			
d	h	d	h
3	4	17	23
6	2	18	16
7	0	19	20
8	17	20	1
10	3	20	2
10	18	20	10
10	22	20	19
11	23	24	8
13	9	24	17
13	13	25	6
14	14	27	2
16	18		

settembre			
d	h	d	h
1	6	14	6
1	17	14	23
2	10	15	5
3	13	16	1
5	20	19	1
7	9	19	19
7	21	20	13
8	4	21	8
8	10	21	11
10	23	21	16
11	5	23	3
11	12	23	5
12	2	23	9
14	1	29	16

ottobre			
d	h	d	h
1	0	13	10
1	3	14	21
4	19	17	1
6	13	17	7
7	17	17	18
7	18	18	18
8	10	20	10
8	11	23	1
9	17	26	22
10	0	29	1
11	15	30	12
12	7		

novembre			
d	h		d h
1	3	Regulus 4.7N della Luna	14 2 Nettuno 4.6S della Luna
3	17	Luna al perigeo	15 11 Luna all'apogeo
4	20	Spica 2.7N della Luna	15 17 Mercurio 2.5N di Antares
5	8	Venere 0.1N della Luna	16 16 Urano 5.9S della Luna
6	4	Luna nuova	16 16 Venere stazionario
7	3	Mercurio 1.7N della Luna	19 6 Giove stazionario
7	7	Nettuno stazionario	20 19 Mercurio 1.7S di Marte
7	21	Marte 1.7N della Luna	21 17 Luna piena
8	1	Antares 2.4S della Luna	23 4 Massima declinaz. lunare (24.3)
8	17	Minima declinaz. lunare (-24.3)	28 9 Regulus 4.8N della Luna
9	20	Plutone 4.7N della Luna	28 20 Ultimo quarto
10	23	Marte 3.9N di Antares	30 18 Luna al perigeo
13	16	Primo quarto	

dicembre			
d	h		d h
1	10	Mercurio massima elong. E(21)	13 23 Mercurio 1.0N di Marte
2	4	Spica 2.8N della Luna	14 0 Urano 6.0S della Luna
5	11	Antares 2.5S della Luna	14 4 Marte 5.4S di Plutone
5	17	Luna nuova	20 1 Mercurio congiunzione inferiore
6	2	Minima declinaz. lunare (-24.3)	20 12 Massima declinaz. lunare (24.2)
6	10	Urano stazionario	21 8 Luna piena Eclisse
6	21	Marte 0.5S della Luna	21 23 Solstizio
7	7	Plutone 4.4N della Luna	25 12 Luna al perigeo
7	8	Mercurio 1.7S della Luna	25 15 Regulus 4.8N della Luna
10	7	Mercurio stazionario	27 1 Plutone in congiunzione
11	11	Nettuno 4.7S della Luna	28 4 Ultimo quarto
13	8	Luna all'apogeo	29 10 Spica 2.8N della Luna
13	13	Primo quarto	30 12 Mercurio stazionario
13	16	Mercurio 4.5S di Plutone	

© (8)

I valori di questa tabella sono approssimativi, per precisioni maggiori consultare i capitoli successivi

january			
d	h		d h
1	20	Moon at perigee	15 19 Mercury stationary
3	2	Earth at perihelion	17 1 Moon at apogee
4	2	Regulus 3.7N of Moon	17 20 Neptune 3.3S of Moon
4	18	Mercury inferior conjunction	18 6 Jupiter 4.2S of Moon
5	11	Mercury 3.4N of Venus	20 6 Uranus 5.4S of Moon
7	10	LAST QUARTER	23 10 FIRST QUARTER
7	23	Spica 3.2N of Moon	26 20 Moon furthest North (25.7)
11	13	Antares 1.1S of Moon	27 8 Mercury greatest elong W(25)
11	21	Venus superior conjunction	27 19 Mars nearest to Earth
12	8	Moon furthest South (-25.7)	29 19 Mars at opposition
13	16	Mercury 4.5N of Moon	30 6 FULL MOON
14	18	Saturn stationary	30 8 Moon at perigee
15	7	NEW MOON	31 13 Regulus 3.7N of Moon
15	9	Venus 1.4S of Moon	

february			
d	h		d h
4	6	Spica 3.2N of Moon	15 1 Jupiter 4.6S of Moon
5	23	LAST QUARTER	16 14 Uranus 5.4S of Moon
7	19	Antares 1.2S of Moon	17 2 Venus 0.5S of Jupiter
8	5	Venus 1.0S of Neptune	22 0 FIRST QUARTER
8	14	Moon furthest South (-25.7)	23 5 Moon furthest North (25.6)
12	4	Mercury 2.2S of Moon	26 3 Mars 5.2N of Moon
13	1	Moon at apogee	27 13 Mercury 1.7S of Neptune
14	2	NEW MOON	27 20 Moon at perigee
14	4	Neptune 3.4S of Moon	28 0 Regulus 3.8N of Moon
14	20	Venus 5.0S of Moon	28 10 Jupiter at conjunction
14	23	Neptune at conjunction	28 16 FULL MOON

march			
d	h		d h
3	16	Spica 3.0N of Moon	15 21 NEW MOON
4	4	Venus 0.6S of Uranus	15 23 Uranus 5.4S of Moon
7	2	Antares 1.3S of Moon	17 6 Uranus at conjunction
7	15	LAST QUARTER	20 17 Equinox
7	21	Moon furthest South (-25.6)	22 0 Saturn at opposition
8	1	Mercury 1.1S of Jupiter	22 11 Moon furthest North (25.4)
11	9	Mars stationary	23 10 FIRST QUARTER
12	10	Moon at apogee	25 12 Mars 4.4N of Moon
13	12	Neptune 3.6S of Moon	27 10 Regulus 3.9N of Moon
14	12	Mercury superior conjunction	28 4 Moon at perigee
14	21	Jupiter 5.0S of Moon	30 2 FULL MOON
15	21	Mercury 0.6S of Uranus	31 2 Spica 2.9N of Moon

april			
d	h		d h
3	11	Antares 1.5S of Moon	16 10 Venus 4.0S of Moon
4	5	Moon furthest South (-25.3)	18 13 Mercury stationary
6	9	LAST QUARTER	18 17 Moon furthest North (25.2)
7	0	Pluto stationary	21 18 FIRST QUARTER
8	23	Mercury greatest elong E(19)	22 7 Mars 4.4N of Moon
9	3	Moon at apogee	23 18 Regulus 4.1N of Moon
9	21	Neptune 3.8S of Moon	24 20 Moon at perigee
11	17	Jupiter 5.5S of Moon	27 12 Spica 2.9N of Moon
12	9	Uranus 5.4S of Moon	28 12 FULL MOON
14	12	NEW MOON	28 16 Mercury inferior conjunction
15	21	Mercury 1.5S of Moon	30 20 Antares 1.7S of Moon

may			
d	h		d h
1	14	Moon furthest South (-25.1)	20 8 Mars 4.8N of Moon
2	20	Pluto 5.9N of Moon	20 8 Moon at perigee
6	4	LAST QUARTER	20 23 FIRST QUARTER
6	22	Moon at apogee	20 23 Regulus 4.2N of Moon
7	6	Neptune 4.0S of Moon	24 19 Spica 3.0N of Moon
9	12	Jupiter 5.9S of Moon	26 3 Mercury greatest elong W(25)
9	20	Uranus 5.6S of Moon	27 23 FULL MOON
11	0	Mercury stationary	28 5 Antares 1.8S of Moon
14	1	NEW MOON	28 22 Moon furthest South (-25.0)
15	23	Moon furthest North (25.1)	30 3 Pluto 5.9N of Moon
16	10	Venus 0.1S of Moon Occn	31 16 Saturn stationary

june			
d	h		d h
1	1	Neptune stationary	15 17 Mercury 4.5N of Aldebaran
3	14	Neptune 4.2S of Moon	17 5 Regulus 4.3N of Moon
3	17	Moon at apogee	17 14 Mars 5.3N of Moon
4	22	LAST QUARTER	19 4 FIRST QUARTER
6	6	Uranus 5.8S of Moon	21 1 Spica 3.1N of Moon
7	4	Mars 0.8N of Regulus	21 11 Solstice
8	12	Jupiter 0.4S of Uranus	24 12 Antares 1.8S of Moon
8	17	Venus 4.7S of Pollux	25 5 Moon furthest South (-25.0)
11	0	Mercury 5.2S of Moon	25 18 Pluto at opposition
12	7	Moon furthest North (25.0)	26 10 Pluto 5.8N of Moon
12	11	NEW MOON	26 11 FULL MOON Eclipse
15	5	Venus 3.7N of Moon	28 12 Mercury superior conjunction
15	15	Moon at perigee	30 22 Neptune 4.3S of Moon

july			
d	h		d h
1	9	Moon at apogee	16 0 Mars 5.6N of Moon
3	14	Uranus 5.9S of Moon	18 7 Spica 3.1N of Moon
4	14	LAST QUARTER	18 10 FIRST QUARTER
6	0	Uranus stationary	21 18 Antares 1.8S of Moon
6	8	Mercury 4.9S of Pollux	22 11 Moon furthest South (-25.0)
6	10	Earth at aphelion	23 15 Pluto 5.8N of Moon
9	16	Moon furthest North (25.0)	24 3 Jupiter stationary
10	11	Venus 1.0N of Regulus	26 1 FULL MOON
11	19	NEW MOON Eclipse	27 21 Mercury 0.3S of Regulus
12	22	Mercury 3.9N of Moon	28 3 Neptune 4.2S of Moon
13	11	Moon at perigee	28 23 Moon at apogee
14	13	Regulus 4.3N of Moon	30 21 Uranus 5.9S of Moon
14	21	Venus 5.4N of Moon	31 8 Mars 1.8S of Saturn

august			
d	h		d h
3	4	LAST QUARTER	17 23 Antares 1.9S of Moon
6	2	Moon furthest North (24.9)	18 16 Moon furthest South (-24.9)
7	0	Mercury greatest elong E(27)	19 20 Pluto 5.6N of Moon
8	17	Venus 2.7S of Saturn	20 1 Venus greatest elong E(46)
10	3	NEW MOON	20 2 Mercury stationary
10	18	Moon at perigee	20 10 Neptune at opposition
10	22	Regulus 4.3N of Moon	20 19 Venus 2.0S of Mars
11	23	Mercury 2.1N of Moon	24 8 Neptune 4.2S of Moon
13	9	Venus 4.1N of Moon	24 17 FULL MOON
13	13	Mars 5.4N of Moon	25 6 Moon at apogee
14	14	Spica 3.0N of Moon	27 2 Uranus 5.8S of Moon
16	18	FIRST QUARTER	
september			
d	h		d h
1	6	Venus 1.0S of Spica	14 6 Antares 2.1S of Moon
1	17	LAST QUARTER	14 23 Moon furthest South (-24.7)
2	10	Moon furthest North (24.8)	15 5 FIRST QUARTER
3	13	Mercury inferior conjunction	16 1 Pluto 5.4N of Moon
5	20	Mars 2.1N of Spica	19 1 Jupiter 0.8S of Uranus
7	9	Regulus 4.3N of Moon	19 19 Mercury greatest elong W(18)
7	21	Mercury 1.5N of Moon	20 13 Neptune 4.2S of Moon
8	4	Moon at perigee	21 8 Moon at apogee
8	10	NEW MOON	21 11 Jupiter at opposition
10	23	Spica 2.8N of Moon	21 16 Uranus at opposition
11	5	Mars 4.7N of Moon	23 3 Equinox
11	12	Venus 0.3N of Moon	23 5 Uranus 5.7S of Moon
12	2	Mercury stationary	23 9 FULL MOON
14	1	Pluto stationary	29 16 Moon furthest North (24.6)
october			
d	h		d h
1	0	Saturn at conjunction	13 10 Pluto 5.0N of Moon
1	3	LAST QUARTER	14 21 FIRST QUARTER
4	19	Regulus 4.5N of Moon	17 1 Mercury superior conjunction
6	13	Moon at perigee	17 7 Mercury 2.9N of Spica
7	17	Venus stationary	17 18 Neptune 4.4S of Moon
7	18	NEW MOON	18 18 Moon at apogee
8	10	Spica 2.7N of Moon	20 10 Uranus 5.7S of Moon
8	11	Mercury 0.5S of Saturn	23 1 FULL MOON
9	17	Venus 3.2S of Moon	26 22 Moon furthest North (24.4)
10	0	Mars 3.5N of Moon	29 1 Venus inferior conjunction
11	15	Antares 2.3S of Moon	30 12 LAST QUARTER
12	7	Moon furthest South (-24.5)	
november			
d	h		d h
1	3	Regulus 4.7N of Moon	14 2 Neptune 4.6S of Moon
3	17	Moon at perigee	15 11 Moon at apogee
4	20	Spica 2.7N of Moon	15 17 Mercury 2.5N of Antares
5	8	Venus 0.1N of Moon	16 16 Uranus 5.9S of Moon
6	4	NEW MOON	16 16 Venus stationary
7	3	Mercury 1.7N of Moon	19 6 Jupiter stationary
7	7	Neptune stationary	20 19 Mercury 1.7S of Mars
7	21	Mars 1.7N of Moon	21 17 FULL MOON
8	1	Antares 2.4S of Moon	23 4 Moon furthest North (24.3)
8	17	Moon furthest South (-24.3)	28 9 Regulus 4.8N of Moon
9	20	Pluto 4.7N of Moon	28 20 LAST QUARTER
10	23	Mars 3.9N of Antares	30 18 Moon at perigee
13	16	FIRST QUARTER	
december			
d	h		d h
1	10	Mercury greatest elong E(21)	13 23 Mercury 1.0N of Mars
2	4	Spica 2.8N of Moon	14 0 Uranus 6.0S of Moon
5	11	Antares 2.5S of Moon	14 4 Mars 5.4S of Pluto
5	17	NEW MOON	20 1 Mercury inferior conjunction
6	2	Moon furthest South (-24.3)	20 12 Moon furthest North (24.2)
6	10	Uranus stationary	21 8 FULL MOON
6	21	Mars 0.5S of Moon	21 23 Solstice
7	7	Pluto 4.4N of Moon	25 12 Moon at perigee
7	8	Mercury 1.7S of Moon	25 15 Regulus 4.8N of Moon
10	7	Mercury stationary	27 1 Pluto at conjunction
11	11	Neptune 4.7S of Moon	28 4 LAST QUARTER
13	8	Moon at apogee	29 10 Spica 2.8N of Moon
13	13	FIRST QUARTER	30 12 Mercury stationary
13	16	Mercury 4.5S of Pluto	

The values of this charts are approximate, for greater precisions to consult the following chapters

# EFFEMERIDI DEL SOLE - EPHEMERIDES OF THE SUN

Date	A.R. Geoc.	Dec. Geoc.	A.R. Topoc.	Dec. Topoc.	Distance A.U.	Light (m)	Parall. "	Diam. "
01/01/2010	18h 45m 28.25s	-23° 01' 38.2"	18h 45m 28.35s	-23° 01' 41.1"	0.9833029	8.18	8.9	1951.9
02/01/2010	18h 49m 52.97s	-22° 56' 37.1"	18h 49m 53.07s	-22° 56' 40.0"	0.9832930	8.18	8.9	1951.9
03/01/2010	18h 54m 17.35s	-22° 51' 08.6"	18h 54m 17.45s	-22° 51' 11.5"	0.9832897	8.18	8.9	1951.9
04/01/2010	18h 58m 41.37s	-22° 45' 12.8"	18h 58m 41.47s	-22° 45' 15.7"	0.9832928	8.18	8.9	1951.9
05/01/2010	19h 03m 05.01s	-22° 38' 49.8"	19h 03m 05.10s	-22° 38' 52.8"	0.9833022	8.18	8.9	1951.9
06/01/2010	19h 07m 28.23s	-22° 31' 59.9"	19h 07m 28.33s	-22° 32' 02.9"	0.9833175	8.18	8.9	1951.8
07/01/2010	19h 11m 51.03s	-22° 24' 43.2"	19h 11m 51.12s	-22° 24' 46.2"	0.9833383	8.18	8.9	1951.8
08/01/2010	19h 16m 13.37s	-22° 16' 59.9"	19h 16m 13.46s	-22° 17' 02.9"	0.9833644	8.18	8.9	1951.7
09/01/2010	19h 20m 35.22s	-22° 08' 50.2"	19h 20m 35.31s	-22° 08' 53.3"	0.9833953	8.18	8.9	1951.7
10/01/2010	19h 24m 56.56s	-22° 00' 14.5"	19h 24m 56.65s	-22° 00' 17.5"	0.9834309	8.18	8.9	1951.6
11/01/2010	19h 29m 17.36s	-21° 51' 12.9"	19h 29m 17.45s	-21° 51' 15.9"	0.9834709	8.18	8.9	1951.5
12/01/2010	19h 33m 37.60s	-21° 41' 45.7"	19h 33m 37.69s	-21° 41' 48.8"	0.9835151	8.18	8.9	1951.4
13/01/2010	19h 37m 57.25s	-21° 31' 53.2"	19h 37m 57.34s	-21° 31' 56.3"	0.9835632	8.18	8.9	1951.3
14/01/2010	19h 42m 16.28s	-21° 21' 35.7"	19h 42m 16.37s	-21° 21' 38.9"	0.9836153	8.18	8.9	1951.2
15/01/2010	19h 46m 34.67s	-21° 10' 53.5"	19h 46m 34.75s	-21° 10' 56.7"	0.9836712	8.18	8.9	1951.1
16/01/2010	19h 50m 52.39s	-20° 59' 47.0"	19h 50m 52.48s	-20° 59' 50.1"	0.9837308	8.18	8.9	1951.0
17/01/2010	19h 55m 09.43s	-20° 48' 16.3"	19h 55m 09.51s	-20° 48' 19.6"	0.9837942	8.18	8.9	1950.9
18/01/2010	19h 59m 25.75s	-20° 36' 22.0"	19h 59m 25.84s	-20° 36' 25.2"	0.9838614	8.18	8.9	1950.7
19/01/2010	20h 03m 41.35s	-20° 24' 04.2"	20h 03m 41.44s	-20° 24' 07.5"	0.9839324	8.18	8.9	1950.6
20/01/2010	20h 07m 56.21s	-20° 11' 23.4"	20h 07m 56.29s	-20° 11' 26.7"	0.9840075	8.18	8.9	1950.5
21/01/2010	20h 12m 10.31s	-19° 58' 19.9"	20h 12m 10.39s	-19° 58' 23.2"	0.9840866	8.18	8.9	1950.3
22/01/2010	20h 16m 23.64s	-19° 44' 54.0"	20h 16m 23.72s	-19° 44' 57.4"	0.9841700	8.19	8.9	1950.1
23/01/2010	20h 20m 36.19s	-19° 31' 06.2"	20h 20m 36.27s	-19° 31' 09.6"	0.9842578	8.19	8.9	1950.0
24/01/2010	20h 24m 47.94s	-19° 16' 56.8"	20h 24m 48.02s	-19° 17' 00.2"	0.9843503	8.19	8.9	1949.8
25/01/2010	20h 28m 58.89s	-19° 02' 26.1"	20h 28m 58.97s	-19° 02' 29.6"	0.9844477	8.19	8.9	1949.6
26/01/2010	20h 33m 09.04s	-18° 47' 34.6"	20h 33m 09.12s	-18° 47' 38.1"	0.9845502	8.19	8.9	1949.4
27/01/2010	20h 37m 18.37s	-18° 32' 22.7"	20h 37m 18.45s	-18° 32' 26.3"	0.9846583	8.19	8.9	1949.2
28/01/2010	20h 41m 26.88s	-18° 16' 50.7"	20h 41m 26.96s	-18° 16' 54.3"	0.9847720	8.19	8.9	1948.9
29/01/2010	20h 45m 34.57s	-18° 00' 59.0"	20h 45m 34.65s	-18° 01' 02.6"	0.9848918	8.19	8.9	1948.7
30/01/2010	20h 49m 41.44s	-17° 44' 48.0"	20h 49m 41.52s	-17° 44' 51.7"	0.9850176	8.19	8.9	1948.5
31/01/2010	20h 53m 47.49s	-17° 28' 18.1"	20h 53m 47.56s	-17° 28' 21.8"	0.9851496	8.19	8.9	1948.2
01/02/2010	20h 57m 52.72s	-17° 11' 29.5"	20h 57m 52.79s	-17° 11' 33.2"	0.9852878	8.19	8.9	1947.9
02/02/2010	21h 01m 57.14s	-16° 54' 22.7"	21h 01m 57.21s	-16° 54' 26.4"	0.9854318	8.20	8.9	1947.6
03/02/2010	21h 06m 00.76s	-16° 36' 58.0"	21h 06m 00.83s	-16° 37' 01.8"	0.9855815	8.20	8.9	1947.3
04/02/2010	21h 10m 03.57s	-16° 19' 15.8"	21h 10m 03.65s	-16° 19' 19.6"	0.9857364	8.20	8.9	1947.0
05/02/2010	21h 14m 05.60s	-16° 01' 16.5"	21h 14m 05.68s	-16° 01' 20.4"	0.9858963	8.20	8.9	1946.7
06/02/2010	21h 18m 06.85s	-15° 43' 00.6"	21h 18m 06.92s	-15° 43' 04.5"	0.9860607	8.20	8.9	1946.4
07/02/2010	21h 22m 07.31s	-15° 24' 28.3"	21h 22m 07.38s	-15° 24' 32.3"	0.9862294	8.20	8.9	1946.1
08/02/2010	21h 26m 06.99s	-15° 05' 40.2"	21h 26m 07.06s	-15° 05' 44.3"	0.9864019	8.20	8.9	1945.7
09/02/2010	21h 30m 05.90s	-14° 46' 36.8"	21h 30m 05.97s	-14° 46' 40.8"	0.9865780	8.21	8.9	1945.4
10/02/2010	21h 34m 04.03s	-14° 27' 18.3"	21h 34m 04.10s	-14° 27' 22.4"	0.9867574	8.21	8.9	1945.0
11/02/2010	21h 38m 01.40s	-14° 07' 45.3"	21h 38m 01.47s	-14° 07' 49.5"	0.9869400	8.21	8.9	1944.7
12/02/2010	21h 41m 58.01s	-13° 47' 58.2"	21h 41m 58.08s	-13° 48' 02.4"	0.9871254	8.21	8.9	1944.3
13/02/2010	21h 45m 53.86s	-13° 27' 57.5"	21h 45m 53.93s	-13° 28' 01.7"	0.9873136	8.21	8.9	1943.9
14/02/2010	21h 49m 48.96s	-13° 07' 43.5"	21h 49m 49.03s	-13° 07' 47.7"	0.9875045	8.21	8.9	1943.6
15/02/2010	21h 53m 43.33s	-12° 47' 16.7"	21h 53m 43.40s	-12° 47' 21.0"	0.9876978	8.21	8.9	1943.2
16/02/2010	21h 57m 36.96s	-12° 26' 37.5"	21h 57m 37.03s	-12° 26' 41.9"	0.9878937	8.22	8.9	1942.8
17/02/2010	22h 01m 29.86s	-12° 05' 46.4"	22h 01m 29.94s	-12° 05' 50.8"	0.9880921	8.22	8.9	1942.4
18/02/2010	22h 05m 22.06s	-11° 44' 43.8"	22h 05m 22.13s	-11° 44' 48.2"	0.9882929	8.22	8.9	1942.0
19/02/2010	22h 09m 13.56s	-11° 23' 30.1"	22h 09m 13.63s	-11° 23' 34.6"	0.9884964	8.22	8.9	1941.6
20/02/2010	22h 13m 04.37s	-11° 02' 05.7"	22h 13m 04.44s	-11° 02' 10.3"	0.9887025	8.22	8.9	1941.2
21/02/2010	22h 16m 54.51s	-10° 40' 31.2"	22h 16m 54.58s	-10° 40' 35.8"	0.9889114	8.22	8.8	1940.8
22/02/2010	22h 20m 43.98s	-10° 18' 46.8"	22h 20m 44.05s	-10° 18' 51.4"	0.9891234	8.23	8.8	1940.4
23/02/2010	22h 24m 32.81s	-09° 56' 53.0"	22h 24m 32.88s	-09° 56' 57.7"	0.9893385	8.23	8.8	1939.9
24/02/2010	22h 28m 21.01s	-09° 34' 50.3"	22h 28m 21.08s	-09° 34' 55.0"	0.9895572	8.23	8.8	1939.5
25/02/2010	22h 32m 08.59s	-09° 12' 39.0"	22h 32m 08.66s	-09° 12' 43.8"	0.9897795	8.23	8.8	1939.1
26/02/2010	22h 35m 55.57s	-08° 50' 19.5"	22h 35m 55.64s	-08° 50' 24.3"	0.9900059	8.23	8.8	1938.6
27/02/2010	22h 39m 41.96s	-08° 27' 52.3"	22h 39m 42.04s	-08° 27' 57.1"	0.9902365	8.24	8.8	1938.2
28/02/2010	22h 43m 27.80s	-08° 05' 17.6"	22h 43m 27.87s	-08° 05' 22.5"	0.9904714	8.24	8.8	1937.7
01/03/2010	22h 47m 13.09s	-07° 42' 35.9"	22h 47m 13.17s	-07° 42' 40.8"	0.9907108	8.24	8.8	1937.3
02/03/2010	22h 50m 57.88s	-07° 19' 47.4"	22h 50m 57.95s	-07° 19' 52.4"	0.9909544	8.24	8.8	1936.8
03/03/2010	22h 54m 42.17s	-06° 56' 52.6"	22h 54m 42.24s	-06° 56' 57.7"	0.9912023	8.24	8.8	1936.3
04/03/2010	22h 58m 26.00s	-06° 33' 51.8"	22h 58m 26.07s	-06° 33' 56.9"	0.9914540	8.25	8.8	1935.8
05/03/2010	23h 02m 09.39s	-06° 10' 45.4"	23h 02m 09.46s	-06° 10' 50.5"	0.9917092	8.25	8.8	1935.3
06/03/2010	23h 05m 52.35s	-05° 47' 33.6"	23h 05m 52.43s	-05° 47' 38.9"	0.9919677	8.25	8.8	1934.8
07/03/2010	23h 09m 34.92s	-05° 24' 17.1"	23h 09m 35.00s	-05° 24' 22.3"	0.9922289	8.25	8.8	1934.3
08/03/2010	23h 13m 17.11s	-05° 00' 56.0"	23h 13m 17.18s	-05° 01' 01.3"	0.9924926	8.25	8.8	1933.8
09/03/2010	23h 16m 58.93s	-04° 37' 30.9"	23h 16m 59.00s	-04° 37' 36.3"	0.9927583	8.26	8.8	1933.3
10/03/2010	23h 20m 40.40s	-04° 14' 02.2"	23h 20m 40.48s	-04° 14' 07.6"	0.9930258	8.26	8.8	1932.7
11/03/2010	23h 24m 21.55s	-03° 50' 30.1"	23h 24m 21.63s	-03° 50' 35.6"	0.9932948	8.26	8.8	1932.2
12/03/2010	23h 28m 02.39s	-03° 26' 55.2"	23h 28m 02.46s	-03° 27' 00.7"	0.9935650	8.26	8.8	1931.7
13/03/2010	23h 31m 42.93s	-03° 03' 17.8"	23h 31m 43.01s	-03° 03' 23.4"	0.9938362	8.27	8.8	1931.2
14/03/2010	23h 35m 23.20s	-02° 39' 38.4"	23h 35m 23.28s	-02° 39' 43.9"	0.9941081	8.27	8.8	1930.6
15/03/2010	23h 39m 03.22s	-02° 15' 57.2"	23h 39m 03.29s	-02° 16' 02.8"	0.9943805	8.27	8.8	1930.1
16/03/2010	23h 42m 42.99s	-01° 52' 14.8"	23h 42m 43.07s	-01° 52' 20.4"	0.9946534	8.27	8.8	1929.6
17/03/2010	23h 46m 22.55s	-01° 28' 31.4"	23h 46m 22.63s	-01° 28' 37.1"	0.9949265	8.27	8.8	1929.1
18/03/2010	23h 50m 01.91s	-01° 04' 47.5"	23h 50m 01.99s	-01° 04' 53.2"	0.9951998	8.28	8.8	1928.5
19/03/2010	23h 53m 41.08s	-00° 41' 03.4"	23h 53m 41.16s	-00° 41' 09.2"	0.9954733	8.28	8.8	1928.0
20/03/2010	23h 57m 20.09s	-00° 17' 19.6"	23h 57m 20.17s	-00° 17' 25.5"	0.9957471	8.28	8.8	1927.5
21/03/2010	00h 00m 58.95s	+00° 06' 23.5"	00h 00m 59.03s	+00° 06' 17.7"	0.9960210	8.28	8.8	1926.9
22/03/2010	00h 04m 37.68s	+00° 30' 05.7"	00h 04m 37.76s	+00° 29' 59.8"	0.9962954	8.29	8.8	1926.4
23/03/2010	00h 08m 16.30s	+00° 53' 46.5"	00h 08m 16.39s	+00° 53' 40.6"	0.9965704	8.29	8.8	1925.9
24/03/2010	00h 11m 54.83s	+01° 17' 25.6"	00h 11m 54.91s	+01° 17' 19.6"	0.9968462	8.29	8.8	1925.3
25/03/2010	00h 15m 33.28s	+01° 41' 02.5"	00h 15m 33.36s	+01° 40' 56.5"	0.9971230	8.29	8.8	1924.8
26/03/2010	00h 19m 11.67s	+02° 04' 37.0"	00h 19m 11.75s	+02° 04' 30.9"	0.9974011	8.30	8.8	1924.3
27/03/2010	00h 22m 50.02s	+02° 28' 08.7"	00h 22m 50.11s	+02° 28' 02.5"	0.9976807	8.30	8.8	1923.7
28/03/2010	00h 26m 28.36s	+02° 51' 37.2"	00h 26m 28.45s	+02° 51' 31.0"	0.9979621	8.30	8.8	1923.2
29/03/2010	00h 30m 06.72s	+03° 15' 02.2"	00h 30m 06.80s	+03° 14' 56.0"	0.9982454	8.30	8.8	1922.6
30/03/2010	00h 33m 45.10s	+03° 38' 23.5"	00h 33m 45.19s	+03° 38' 17.3"	0.9985307	8.30	8.8	1922.1
31/03/2010	00h 37m 23.56s	+04° 01' 40.8"	00h 37m 23.64s	+04° 01' 34.5"	0.9988178	8.31	8.8	1921.5

Date	A.R. Geoc.	Dec. Geoc.	A.R. Topoc.	Dec. Topoc.	Distance A.U.	Light (m)	Parall. "	Diam. "
01/04/2010	00h 41m 02.10s	+04° 24' 53.6"	00h 41m 02.18s	+04° 24' 47.3"	0.9991067	8.31	8.8	1921.0
02/04/2010	00h 44m 40.75s	+04° 48' 01.8"	00h 44m 40.84s	+04° 47' 55.4"	0.9993971	8.31	8.8	1920.4
03/04/2010	00h 48m 19.54s	+05° 11' 04.9"	00h 48m 19.63s	+05° 10' 58.5"	0.9996888	8.31	8.8	1919.9
04/04/2010	00h 51m 58.48s	+05° 34' 02.7"	00h 51m 58.57s	+05° 33' 56.2"	0.9999813	8.32	8.7	1919.3
05/04/2010	00h 55m 37.60s	+05° 56' 54.7"	00h 55m 37.69s	+05° 56' 48.2"	1.0002743	8.32	8.7	1918.7
06/04/2010	00h 59m 16.91s	+06° 19' 40.6"	00h 59m 17.00s	+06° 19' 34.1"	1.0005675	8.32	8.7	1918.2
07/04/2010	01h 02m 56.43s	+06° 42' 20.1"	01h 02m 56.53s	+06° 42' 13.6"	1.0008606	8.32	8.7	1917.6
08/04/2010	01h 06m 36.18s	+07° 04' 52.9"	01h 06m 36.28s	+07° 04' 46.3"	1.0011532	8.33	8.7	1917.1
09/04/2010	01h 10m 16.18s	+07° 27' 18.4"	01h 10m 16.27s	+07° 27' 11.8"	1.0014450	8.33	8.7	1916.5
10/04/2010	01h 13m 56.44s	+07° 49' 36.5"	01h 13m 56.53s	+07° 49' 29.9"	1.0017357	8.33	8.7	1915.9
11/04/2010	01h 17m 36.97s	+08° 11' 46.7"	01h 17m 37.06s	+08° 11' 40.0"	1.0020250	8.33	8.7	1915.4
12/04/2010	01h 21m 17.80s	+08° 33' 48.7"	01h 21m 17.89s	+08° 33' 42.0"	1.0023127	8.34	8.7	1914.8
13/04/2010	01h 24m 58.93s	+08° 55' 42.1"	01h 24m 59.03s	+08° 55' 35.4"	1.0025985	8.34	8.7	1914.3
14/04/2010	01h 28m 40.39s	+09° 17' 26.6"	01h 28m 40.49s	+09° 17' 19.8"	1.0028823	8.34	8.7	1913.7
15/04/2010	01h 32m 22.19s	+09° 39' 01.8"	01h 32m 22.29s	+09° 38' 55.0"	1.0031639	8.34	8.7	1913.2
16/04/2010	01h 36m 04.34s	+10° 00' 27.4"	01h 36m 04.43s	+10° 00' 20.6"	1.0034431	8.35	8.7	1912.7
17/04/2010	01h 39m 46.85s	+10° 21' 43.0"	01h 39m 46.94s	+10° 21' 36.1"	1.0037200	8.35	8.7	1912.2
18/04/2010	01h 43m 29.73s	+10° 42' 48.3"	01h 43m 29.82s	+10° 42' 41.4"	1.0039945	8.35	8.7	1911.6
19/04/2010	01h 47m 12.99s	+11° 03' 42.9"	01h 47m 13.09s	+11° 03' 35.9"	1.0042666	8.35	8.7	1911.1
20/04/2010	01h 50m 56.64s	+11° 24' 26.4"	01h 50m 56.74s	+11° 24' 19.4"	1.0045366	8.35	8.7	1910.6
21/04/2010	01h 54m 40.69s	+11° 44' 58.6"	01h 54m 40.79s	+11° 44' 51.6"	1.0048047	8.36	8.7	1910.1
22/04/2010	01h 58m 25.16s	+12° 05' 19.1"	01h 58m 25.26s	+12° 05' 12.1"	1.0050709	8.36	8.7	1909.6
23/04/2010	02h 02m 10.04s	+12° 25' 27.5"	02h 02m 10.14s	+12° 25' 20.4"	1.0053357	8.36	8.7	1909.1
24/04/2010	02h 05m 55.36s	+12° 45' 23.5"	02h 05m 55.46s	+12° 45' 16.5"	1.0055993	8.36	8.7	1908.6
25/04/2010	02h 09m 41.12s	+13° 05' 06.9"	02h 09m 41.22s	+13° 04' 59.8"	1.0058620	8.37	8.7	1908.1
26/04/2010	02h 13m 27.35s	+13° 24' 37.3"	02h 13m 27.45s	+13° 24' 30.2"	1.0061239	8.37	8.7	1907.6
27/04/2010	02h 17m 14.06s	+13° 43' 54.4"	02h 17m 14.16s	+13° 43' 47.2"	1.0063852	8.37	8.7	1907.1
28/04/2010	02h 21m 01.26s	+14° 02' 57.9"	02h 21m 01.36s	+14° 02' 50.8"	1.0066459	8.37	8.7	1906.6
29/04/2010	02h 24m 48.97s	+14° 21' 47.6"	02h 24m 49.07s	+14° 21' 40.4"	1.0069062	8.37	8.7	1906.1
30/04/2010	02h 28m 37.20s	+14° 40' 23.2"	02h 28m 37.31s	+14° 40' 15.9"	1.0071658	8.38	8.7	1905.6
01/05/2010	02h 32m 25.97s	+14° 58' 44.3"	02h 32m 26.08s	+14° 58' 37.0"	1.0074246	8.38	8.7	1905.1
02/05/2010	02h 36m 15.29s	+15° 16' 50.6"	02h 36m 15.39s	+15° 16' 43.3"	1.0076823	8.38	8.7	1904.6
03/05/2010	02h 40m 05.15s	+15° 34' 41.9"	02h 40m 05.25s	+15° 34' 34.6"	1.0079387	8.38	8.7	1904.1
04/05/2010	02h 43m 55.58s	+15° 52' 17.7"	02h 43m 55.68s	+15° 52' 10.4"	1.0081934	8.38	8.7	1903.7
05/05/2010	02h 47m 46.57s	+16° 09' 37.8"	02h 47m 46.67s	+16° 09' 30.5"	1.0084463	8.39	8.7	1903.2
06/05/2010	02h 51m 38.14s	+16° 26' 41.9"	02h 51m 38.24s	+16° 26' 34.6"	1.0086969	8.39	8.7	1902.7
07/05/2010	02h 55m 30.28s	+16° 43' 29.7"	02h 55m 30.38s	+16° 43' 22.3"	1.0089449	8.39	8.7	1902.2
08/05/2010	02h 59m 23.00s	+17° 00' 00.7"	02h 59m 23.11s	+16° 59' 53.3"	1.0091901	8.39	8.7	1901.8
09/05/2010	03h 03m 16.31s	+17° 16' 14.8"	03h 03m 16.42s	+17° 16' 07.4"	1.0094321	8.40	8.7	1901.3
10/05/2010	03h 07m 10.21s	+17° 32' 11.6"	03h 07m 10.32s	+17° 32' 04.1"	1.0096707	8.40	8.7	1900.9
11/05/2010	03h 11m 04.69s	+17° 47' 50.7"	03h 11m 04.80s	+17° 47' 43.3"	1.0099056	8.40	8.7	1900.4
12/05/2010	03h 14m 59.76s	+18° 03' 12.0"	03h 14m 59.87s	+18° 03' 04.5"	1.0101365	8.40	8.7	1900.0
13/05/2010	03h 18m 55.42s	+18° 18' 15.0"	03h 18m 55.52s	+18° 18' 07.5"	1.0103632	8.40	8.7	1899.6
14/05/2010	03h 22m 51.65s	+18° 32' 59.5"	03h 22m 51.76s	+18° 32' 52.1"	1.0105855	8.40	8.7	1899.2
15/05/2010	03h 26m 48.46s	+18° 47' 25.3"	03h 26m 48.57s	+18° 47' 17.8"	1.0108034	8.41	8.7	1898.8
16/05/2010	03h 30m 45.84s	+19° 01' 32.0"	03h 30m 45.95s	+19° 01' 24.5"	1.0110166	8.41	8.7	1898.4
17/05/2010	03h 34m 43.77s	+19° 15' 19.3"	03h 34m 43.88s	+19° 15' 11.8"	1.0112252	8.41	8.7	1898.0
18/05/2010	03h 38m 42.25s	+19° 28' 47.0"	03h 38m 42.36s	+19° 28' 39.4"	1.0114294	8.41	8.7	1897.6
19/05/2010	03h 42m 41.27s	+19° 41' 54.7"	03h 42m 41.38s	+19° 41' 47.1"	1.0116293	8.41	8.6	1897.2
20/05/2010	03h 46m 40.81s	+19° 54' 42.3"	03h 46m 40.92s	+19° 54' 34.7"	1.0118251	8.42	8.6	1896.8
21/05/2010	03h 50m 40.87s	+20° 07' 09.4"	03h 50m 40.98s	+20° 07' 01.8"	1.0120171	8.42	8.6	1896.5
22/05/2010	03h 54m 41.44s	+20° 19' 15.8"	03h 54m 41.55s	+20° 19' 08.2"	1.0122055	8.42	8.6	1896.1
23/05/2010	03h 58m 42.51s	+20° 31' 01.3"	03h 58m 42.62s	+20° 30' 53.6"	1.0123908	8.42	8.6	1895.8
24/05/2010	04h 02m 44.08s	+20° 42' 25.6"	04h 02m 44.19s	+20° 42' 17.9"	1.0125731	8.42	8.6	1895.4
25/05/2010	04h 06m 46.15s	+20° 53' 28.5"	04h 06m 46.26s	+20° 53' 20.9"	1.0127527	8.42	8.6	1895.1
26/05/2010	04h 10m 48.70s	+21° 04' 09.9"	04h 10m 48.81s	+21° 04' 02.2"	1.0129297	8.42	8.6	1894.8
27/05/2010	04h 14m 51.74s	+21° 14' 29.4"	04h 14m 51.84s	+21° 14' 21.8"	1.0131043	8.43	8.6	1894.4
28/05/2010	04h 18m 55.24s	+21° 24' 27.0"	04h 18m 55.35s	+21° 24' 19.4"	1.0132765	8.43	8.6	1894.1
29/05/2010	04h 22m 59.21s	+21° 34' 02.5"	04h 22m 59.32s	+21° 33' 54.8"	1.0134462	8.43	8.6	1893.8
30/05/2010	04h 27m 03.63s	+21° 43' 15.5"	04h 27m 03.74s	+21° 43' 07.8"	1.0136132	8.43	8.6	1893.5
31/05/2010	04h 31m 08.49s	+21° 52' 06.0"	04h 31m 08.60s	+21° 51' 58.3"	1.0137776	8.43	8.6	1893.2
01/06/2010	04h 35m 13.78s	+22° 00' 33.6"	04h 35m 13.88s	+22° 00' 25.9"	1.0139390	8.43	8.6	1892.9
02/06/2010	04h 39m 19.48s	+22° 08' 38.4"	04h 39m 19.59s	+22° 08' 30.6"	1.0140972	8.43	8.6	1892.6
03/06/2010	04h 43m 25.58s	+22° 16' 19.9"	04h 43m 25.68s	+22° 16' 12.2"	1.0142520	8.44	8.6	1892.3
04/06/2010	04h 47m 32.06s	+22° 23' 38.1"	04h 47m 32.17s	+22° 23' 30.4"	1.0144031	8.44	8.6	1892.0
05/06/2010	04h 51m 38.91s	+22° 30' 32.8"	04h 51m 39.02s	+22° 30' 25.1"	1.0145503	8.44	8.6	1891.7
06/06/2010	04h 55m 46.12s	+22° 37' 03.9"	04h 55m 46.22s	+22° 36' 56.1"	1.0146933	8.44	8.6	1891.5
07/06/2010	04h 59m 53.65s	+22° 43' 11.1"	04h 59m 53.75s	+22° 43' 03.4"	1.0148317	8.44	8.6	1891.2
08/06/2010	05h 04m 01.50s	+22° 48' 54.4"	05h 04m 01.60s	+22° 48' 46.7"	1.0149654	8.44	8.6	1891.0
09/06/2010	05h 08m 09.63s	+22° 54' 13.6"	05h 08m 09.74s	+22° 54' 05.9"	1.0150940	8.44	8.6	1890.7
10/06/2010	05h 12m 18.05s	+22° 59' 08.6"	05h 12m 18.15s	+22° 59' 00.9"	1.0152173	8.44	8.6	1890.5
11/06/2010	05h 16m 26.70s	+23° 03' 39.4"	05h 16m 26.80s	+23° 03' 31.6"	1.0153350	8.44	8.6	1890.3
12/06/2010	05h 20m 35.58s	+23° 07' 45.7"	05h 20m 35.68s	+23° 07' 38.0"	1.0154470	8.45	8.6	1890.1
13/06/2010	05h 24m 44.65s	+23° 11' 27.6"	05h 24m 44.75s	+23° 11' 19.8"	1.0155530	8.45	8.6	1889.9
14/06/2010	05h 28m 53.89s	+23° 14' 45.0"	05h 28m 53.99s	+23° 14' 37.2"	1.0156530	8.45	8.6	1889.7
15/06/2010	05h 33m 03.25s	+23° 17' 37.7"	05h 33m 03.35s	+23° 17' 29.9"	1.0157471	8.45	8.6	1889.5
16/06/2010	05h 37m 12.72s	+23° 20' 05.8"	05h 37m 12.82s	+23° 19' 58.0"	1.0158353	8.45	8.6	1889.3
17/06/2010	05h 41m 22.27s	+23° 22' 09.1"	05h 41m 22.37s	+23° 22' 01.4"	1.0159180	8.45	8.6	1889.2
18/06/2010	05h 45m 31.86s	+23° 23' 47.7"	05h 45m 31.96s	+23° 23' 39.9"	1.0159953	8.45	8.6	1889.0
19/06/2010	05h 49m 41.48s	+23° 25' 01.5"	05h 49m 41.58s	+23° 24' 53.8"	1.0160676	8.45	8.6	1888.9
20/06/2010	05h 53m 51.11s	+23° 25' 50.5"	05h 53m 51.21s	+23° 25' 42.8"	1.0161353	8.45	8.6	1888.8
21/06/2010	05h 58m 00.72s	+23° 26' 14.8"	05h 58m 00.81s	+23° 26' 07.0"	1.0161986	8.45	8.6	1888.7
22/06/2010	06h 02m 10.29s	+23° 26' 14.2"	06h 02m 10.38s	+23° 26' 06.4"	1.0162578	8.45	8.6	1888.6
23/06/2010	06h 06m 19.80s	+23° 25' 48.9"	06h 06m 19.90s	+23° 25' 41.1"	1.0163132	8.45	8.6	1888.5
24/06/2010	06h 10m 29.23s	+23° 24' 58.8"	06h 10m 29.33s	+23° 24' 51.0"	1.0163649	8.45	8.6	1888.4
25/06/2010	06h 14m 38.57s	+23° 23' 44.1"	06h 14m 38.66s	+23° 23' 36.3"	1.0164132	8.45	8.6	1888.3
26/06/2010	06h 18m 47.78s	+23° 22' 04.7"	06h 18m 47.88s	+23° 21' 56.9"	1.0164581	8.45	8.6	1888.2
27/06/2010	06h 22m 56.85s	+23° 20' 00.7"	06h 22m 56.95s	+23° 19' 52.9"	1.0164995	8.45	8.6	1888.1
28/06/2010	06h 27m 05.77s	+23° 17' 32.1"	06h 27m 05.86s	+23° 17' 24.3"	1.0165376	8.45	8.6	1888.0
29/06/2010	06h 31m 14.50s	+23° 14' 39.0"	06h 31m 14.59s	+23° 14' 31.2"	1.0165721	8.45	8.6	1888.0
30/06/2010	06h 35m 23.03s	+23° 11' 21.4"	06h 35m 23.12s	+23° 11' 13.7"	1.0166029	8.45	8.6	1887.9
01/07/2010	06h 39m 31.34s	+23° 07' 39.5"	06h 39m 31.4					



Date	A.R. Geoc.	Dec. Geoc.	A.R. Topoc.	Dec. Topoc.	Distance A.U.	Light (m)	Parall. "	Diam. "
05/07/2010	06h 56m 02.02s	+22° 48' 49.6"	06h 56m 02.11s	+22° 48' 41.9"	1.0166963	8.46	8.6	1887.7
06/07/2010	07h 00m 08.95s	+22° 43' 07.2"	07h 00m 09.04s	+22° 42' 59.4"	1.0167014	8.46	8.6	1887.7
07/07/2010	07h 04m 15.55s	+22° 37' 01.0"	07h 04m 15.65s	+22° 36' 53.3"	1.0167012	8.46	8.6	1887.7
08/07/2010	07h 08m 21.81s	+22° 30' 31.3"	07h 08m 21.90s	+22° 30' 23.5"	1.0166957	8.46	8.6	1887.7
09/07/2010	07h 12m 27.69s	+22° 23' 38.1"	07h 12m 27.78s	+22° 23' 30.4"	1.0166845	8.46	8.6	1887.8
10/07/2010	07h 16m 33.18s	+22° 16' 21.7"	07h 16m 33.27s	+22° 16' 14.0"	1.0166674	8.46	8.6	1887.8
11/07/2010	07h 20m 38.25s	+22° 08' 42.2"	07h 20m 38.34s	+22° 08' 34.5"	1.0166441	8.46	8.6	1887.8
12/07/2010	07h 24m 42.89s	+22° 00' 39.9"	07h 24m 42.98s	+22° 00' 32.2"	1.0166145	8.45	8.6	1887.9
13/07/2010	07h 28m 47.06s	+21° 52' 15.0"	07h 28m 47.15s	+21° 52' 07.3"	1.0165786	8.45	8.6	1888.0
14/07/2010	07h 32m 50.76s	+21° 43' 27.6"	07h 32m 50.84s	+21° 43' 19.9"	1.0165364	8.45	8.6	1888.0
15/07/2010	07h 36m 53.95s	+21° 34' 18.0"	07h 36m 54.03s	+21° 34' 10.4"	1.0164880	8.45	8.6	1888.1
16/07/2010	07h 40m 56.62s	+21° 24' 46.4"	07h 40m 56.70s	+21° 24' 38.8"	1.0164339	8.45	8.6	1888.2
17/07/2010	07h 44m 58.75s	+21° 14' 53.0"	07h 44m 58.84s	+21° 14' 45.4"	1.0163742	8.45	8.6	1888.3
18/07/2010	07h 49m 00.35s	+21° 04' 38.1"	07h 49m 00.44s	+21° 04' 30.4"	1.0163093	8.45	8.6	1888.5
19/07/2010	07h 53m 01.39s	+20° 54' 01.8"	07h 53m 01.48s	+20° 53' 54.2"	1.0162396	8.45	8.6	1888.6
20/07/2010	07h 57m 01.87s	+20° 43' 04.4"	07h 57m 01.95s	+20° 42' 56.8"	1.0161655	8.45	8.6	1888.7
21/07/2010	08h 01m 01.77s	+20° 31' 46.2"	08h 01m 01.86s	+20° 31' 38.6"	1.0160872	8.45	8.6	1888.9
22/07/2010	08h 05m 01.10s	+20° 20' 07.4"	08h 05m 01.19s	+20° 19' 59.8"	1.0160050	8.45	8.6	1889.0
23/07/2010	08h 08m 59.85s	+20° 08' 08.3"	08h 08m 59.94s	+20° 08' 00.7"	1.0159192	8.45	8.6	1889.2
24/07/2010	08h 12m 58.00s	+19° 55' 49.0"	08h 12m 58.09s	+19° 55' 41.5"	1.0158299	8.45	8.6	1889.4
25/07/2010	08h 16m 55.57s	+19° 43' 09.9"	08h 16m 55.65s	+19° 43' 02.4"	1.0157372	8.45	8.6	1889.5
26/07/2010	08h 20m 52.53s	+19° 30' 11.2"	08h 20m 52.62s	+19° 30' 03.6"	1.0156412	8.45	8.6	1889.7
27/07/2010	08h 24m 48.90s	+19° 16' 53.1"	08h 24m 48.98s	+19° 16' 45.5"	1.0155420	8.45	8.6	1889.9
28/07/2010	08h 28m 44.67s	+19° 03' 15.8"	08h 28m 44.75s	+19° 03' 08.3"	1.0154396	8.45	8.6	1890.1
29/07/2010	08h 32m 39.83s	+18° 49' 19.7"	08h 32m 39.92s	+18° 49' 12.2"	1.0153339	8.44	8.6	1890.3
30/07/2010	08h 36m 34.40s	+18° 35' 05.0"	08h 36m 34.49s	+18° 34' 57.5"	1.0152248	8.44	8.6	1890.5
31/07/2010	08h 40m 28.38s	+18° 20' 31.9"	08h 40m 28.46s	+18° 20' 24.4"	1.0151122	8.44	8.6	1890.7
01/08/2010	08h 44m 21.76s	+18° 05' 40.7"	08h 44m 21.85s	+18° 05' 33.2"	1.0149960	8.44	8.6	1890.9
02/08/2010	08h 48m 14.55s	+17° 50' 31.6"	08h 48m 14.64s	+17° 50' 24.2"	1.0148760	8.44	8.6	1891.1
03/08/2010	08h 52m 06.75s	+17° 35' 05.1"	08h 52m 06.84s	+17° 34' 57.7"	1.0147521	8.44	8.6	1891.4
04/08/2010	08h 55m 58.37s	+17° 19' 21.3"	08h 55m 58.46s	+17° 19' 13.9"	1.0146240	8.44	8.6	1891.6
05/08/2010	08h 59m 49.41s	+17° 03' 20.5"	08h 59m 49.49s	+17° 03' 13.2"	1.0144914	8.44	8.6	1891.8
06/08/2010	09h 03m 39.86s	+16° 47' 03.1"	09h 03m 39.95s	+16° 46' 55.8"	1.0143542	8.44	8.6	1892.1
07/08/2010	09h 07m 29.74s	+16° 30' 29.3"	09h 07m 29.83s	+16° 30' 22.0"	1.0142120	8.43	8.6	1892.4
08/08/2010	09h 11m 19.04s	+16° 13' 39.6"	09h 11m 19.12s	+16° 13' 32.3"	1.0140646	8.43	8.6	1892.6
09/08/2010	09h 15m 07.76s	+15° 56' 34.1"	09h 15m 07.84s	+15° 56' 26.8"	1.0139117	8.43	8.6	1892.9
10/08/2010	09h 18m 55.89s	+15° 39' 13.3"	09h 18m 55.98s	+15° 39' 06.1"	1.0137533	8.43	8.6	1893.2
11/08/2010	09h 22m 43.45s	+15° 21' 37.5"	09h 22m 43.54s	+15° 21' 30.3"	1.0135894	8.43	8.6	1893.5
12/08/2010	09h 26m 30.43s	+15° 03' 47.0"	09h 26m 30.52s	+15° 03' 39.8"	1.0134199	8.43	8.6	1893.8
13/08/2010	09h 30m 16.84s	+14° 45' 42.2"	09h 30m 16.93s	+14° 45' 35.0"	1.0132450	8.43	8.6	1894.2
14/08/2010	09h 34m 02.68s	+14° 27' 23.3"	09h 34m 02.77s	+14° 27' 16.1"	1.0130652	8.43	8.6	1894.5
15/08/2010	09h 37m 47.97s	+14° 08' 50.7"	09h 37m 48.05s	+14° 08' 43.5"	1.0128806	8.42	8.6	1894.9
16/08/2010	09h 41m 32.70s	+13° 50' 04.7"	09h 41m 32.79s	+13° 49' 57.5"	1.0126918	8.42	8.6	1895.2
17/08/2010	09h 45m 16.89s	+13° 31' 05.6"	09h 45m 16.98s	+13° 30' 58.5"	1.0124990	8.42	8.6	1895.6
18/08/2010	09h 49m 00.55s	+13° 11' 53.8"	09h 49m 00.64s	+13° 11' 46.8"	1.0123027	8.42	8.6	1895.9
19/08/2010	09h 52m 43.69s	+12° 52' 29.6"	09h 52m 43.78s	+12° 52' 22.6"	1.0121032	8.42	8.6	1896.3
20/08/2010	09h 56m 26.33s	+12° 32' 53.2"	09h 56m 26.42s	+12° 32' 46.2"	1.0119008	8.42	8.6	1896.7
21/08/2010	10h 00m 08.47s	+12° 13' 05.1"	10h 00m 08.56s	+12° 12' 58.1"	1.0116956	8.41	8.6	1897.1
22/08/2010	10h 03m 50.12s	+11° 53' 05.4"	10h 03m 50.21s	+11° 52' 58.5"	1.0114881	8.41	8.6	1897.5
23/08/2010	10h 07m 31.32s	+11° 32' 54.5"	10h 07m 31.41s	+11° 32' 47.6"	1.0112783	8.41	8.6	1897.9
24/08/2010	10h 11m 12.06s	+11° 12' 32.7"	10h 11m 12.15s	+11° 12' 25.8"	1.0110663	8.41	8.7	1898.3
25/08/2010	10h 14m 52.37s	+10° 52' 00.3"	10h 14m 52.46s	+10° 51' 53.4"	1.0108524	8.41	8.7	1898.7
26/08/2010	10h 18m 32.27s	+10° 31' 17.5"	10h 18m 32.36s	+10° 31' 10.7"	1.0106364	8.41	8.7	1899.1
27/08/2010	10h 22m 11.77s	+10° 10' 24.7"	10h 22m 11.86s	+10° 10' 17.9"	1.0104186	8.40	8.7	1899.5
28/08/2010	10h 25m 50.89s	+09° 49' 22.1"	10h 25m 50.98s	+09° 49' 15.4"	1.0101988	8.40	8.7	1899.9
29/08/2010	10h 29m 29.65s	+09° 28' 10.2"	10h 29m 29.75s	+09° 28' 03.4"	1.0099770	8.40	8.7	1900.3
30/08/2010	10h 33m 08.08s	+09° 06' 49.0"	10h 33m 08.17s	+09° 06' 42.3"	1.0097532	8.40	8.7	1900.7
31/08/2010	10h 36m 46.18s	+08° 45' 19.0"	10h 36m 46.27s	+08° 45' 12.3"	1.0095271	8.40	8.7	1901.2
01/09/2010	10h 40m 23.98s	+08° 23' 40.5"	10h 40m 24.08s	+08° 23' 33.9"	1.0092987	8.39	8.7	1901.6
02/09/2010	10h 44m 01.50s	+08° 01' 53.8"	10h 44m 01.60s	+08° 01' 47.2"	1.0090678	8.39	8.7	1902.0
03/09/2010	10h 47m 38.75s	+07° 39' 59.2"	10h 47m 38.85s	+07° 39' 52.6"	1.0088341	8.39	8.7	1902.5
04/09/2010	10h 51m 15.75s	+07° 17' 57.1"	10h 51m 15.85s	+07° 17' 50.5"	1.0085974	8.39	8.7	1902.9
05/09/2010	10h 54m 52.52s	+06° 55' 47.7"	10h 54m 52.61s	+06° 55' 41.2"	1.0083575	8.39	8.7	1903.4
06/09/2010	10h 58m 29.06s	+06° 33' 31.5"	10h 58m 29.16s	+06° 33' 25.1"	1.0081141	8.38	8.7	1903.8
07/09/2010	11h 02m 05.39s	+06° 11' 08.8"	11h 02m 05.49s	+06° 11' 02.4"	1.0078669	8.38	8.7	1904.3
08/09/2010	11h 05m 41.53s	+05° 48' 40.0"	11h 05m 41.63s	+05° 48' 33.6"	1.0076159	8.38	8.7	1904.8
09/09/2010	11h 09m 17.50s	+05° 26' 05.4"	11h 09m 17.60s	+05° 25' 59.0"	1.0073610	8.38	8.7	1905.2
10/09/2010	11h 12m 53.29s	+05° 03' 25.4"	11h 12m 53.39s	+05° 03' 19.0"	1.0071024	8.38	8.7	1905.7
11/09/2010	11h 16m 28.95s	+04° 40' 40.2"	11h 16m 29.05s	+04° 40' 33.9"	1.0068401	8.37	8.7	1906.2
12/09/2010	11h 20m 04.47s	+04° 17' 50.3"	11h 20m 04.57s	+04° 17' 44.1"	1.0065745	8.37	8.7	1906.7
13/09/2010	11h 23m 39.88s	+03° 54' 56.0"	11h 23m 39.98s	+03° 54' 49.8"	1.0063059	8.37	8.7	1907.2
14/09/2010	11h 27m 15.19s	+03° 31' 57.7"	11h 27m 15.29s	+03° 31' 51.5"	1.0060348	8.37	8.7	1907.8
15/09/2010	11h 30m 50.42s	+03° 08' 55.6"	11h 30m 50.52s	+03° 08' 49.5"	1.0057616	8.36	8.7	1908.3
16/09/2010	11h 34m 25.59s	+02° 45' 50.2"	11h 34m 25.69s	+02° 45' 44.1"	1.0054865	8.36	8.7	1908.8
17/09/2010	11h 38m 00.71s	+02° 22' 41.7"	11h 38m 00.82s	+02° 22' 35.6"	1.0052100	8.36	8.7	1909.3
18/09/2010	11h 41m 35.82s	+01° 59' 30.5"	11h 41m 35.92s	+01° 59' 24.4"	1.0049324	8.36	8.7	1909.8
19/09/2010	11h 45m 10.92s	+01° 36' 16.8"	11h 45m 11.03s	+01° 36' 10.9"	1.0046538	8.36	8.7	1910.4
20/09/2010	11h 48m 46.05s	+01° 13' 01.1"	11h 48m 46.15s	+01° 12' 55.2"	1.0043748	8.35	8.7	1910.9
21/09/2010	11h 52m 21.22s	+00° 49' 43.6"	11h 52m 21.32s	+00° 49' 37.7"	1.0040953	8.35	8.7	1911.4
22/09/2010	11h 55m 56.45s	+00° 26' 24.6"	11h 55m 56.56s	+00° 26' 18.8"	1.0038157	8.35	8.7	1912.0
23/09/2010	11h 59m 31.78s	+00° 03' 04.5"	11h 59m 31.89s	+00° 02' 58.7"	1.0035360	8.35	8.7	1912.5
24/09/2010	12h 03m 07.22s	-00° 20' 16.4"	12h 03m 07.33s	-00° 20' 22.2"	1.0032565	8.34	8.7	1913.0
25/09/2010	12h 06m 42.80s	-00° 43' 37.9"	12h 06m 42.91s	-00° 43' 43.7"	1.0029772	8.34	8.7	1913.6
26/09/2010	12h 10m 18.55s	-01° 06' 59.6"	12h 10m 18.66s	-01° 07' 05.3"	1.0026981	8.34	8.7	1914.1
27/09/2010	12h 13m 54.49s	-01° 30' 21.2"	12h 13m 54.60s	-01° 30' 26.9"	1.0024193	8.34	8.7	1914.6
28/09/2010	12h 17m 30.63s	-01° 53' 42.4"	12h 17m 30.74s	-01° 53' 48.0"	1.0021407	8.33	8.7	1915.2
29/09/2010	12h 21m 07.02s	-02° 17' 02.7"	12h 21m 07.13s	-02° 17' 08.3"	1.0018622	8.33	8.7	1915.7
30/09/2010	12h 24m 43.66s	-02° 40' 22.0"	12h 24m 43.77s	-02° 40' 27.5"	1.0015837	8.33	8.7	1916.2
01/10/2010	12h 28m 20.57s	-03° 03' 39.8"	12h 28m 20.69s	-03° 03' 45.3"	1.0013050	8.33	8.7	1916.8
02/10/2010	12h 31m 57.79s	-03° 26' 55.8"	12h 31m 57.91s	-03° 27' 01.2"	1.0010259	8.33	8.7	1917.3
03/10/2010	12h 35m 35.33s	-03° 50' 09.5"	12h 35m 35.44s	-03° 50' 14.9"	1.0007462	8.32	8.7	1917.8
04/10/2010	12h 39m 13.20s	-04° 13' 20.7"	12h 39m 13.3					

Date	A.R. Geoc.	Dec. Geoc.	A.R. Topoc.	Dec. Topoc.	Distance A.U.	Light (m)	Parall. "	Diam. "
08/10/2010	12h 53m 48.41s	-05° 45' 32.2"	12h 53m 48.53s	-05° 45' 37.3"	0.9993299	8.31	8.8	1920.6
09/10/2010	12h 57m 28.23s	-06° 08' 24.8"	12h 57m 28.35s	-06° 08' 29.9"	0.9990424	8.31	8.8	1921.1
10/10/2010	13h 01m 08.50s	-06° 31' 12.5"	13h 01m 08.61s	-06° 31' 17.6"	0.9987535	8.31	8.8	1921.7
11/10/2010	13h 04m 49.21s	-06° 53' 54.9"	13h 04m 49.33s	-06° 53' 60.0"	0.9984636	8.30	8.8	1922.2
12/10/2010	13h 08m 30.39s	-07° 16' 31.7"	13h 08m 30.51s	-07° 16' 36.7"	0.9981731	8.30	8.8	1922.8
13/10/2010	13h 12m 12.06s	-07° 39' 02.5"	13h 12m 12.18s	-07° 39' 07.4"	0.9978822	8.30	8.8	1923.3
14/10/2010	13h 15m 54.22s	-08° 01' 26.8"	13h 15m 54.35s	-08° 01' 31.7"	0.9975914	8.30	8.8	1923.9
15/10/2010	13h 19m 36.90s	-08° 23' 44.3"	13h 19m 37.03s	-08° 23' 49.2"	0.9973010	8.29	8.8	1924.5
16/10/2010	13h 23m 20.12s	-08° 45' 54.7"	13h 23m 20.24s	-08° 45' 59.5"	0.9970114	8.29	8.8	1925.0
17/10/2010	13h 27m 03.88s	-09° 07' 57.5"	13h 27m 04.00s	-09° 08' 02.3"	0.9967229	8.29	8.8	1925.6
18/10/2010	13h 30m 48.21s	-09° 29' 52.4"	13h 30m 48.33s	-09° 29' 57.1"	0.9964357	8.29	8.8	1926.1
19/10/2010	13h 34m 33.13s	-09° 51' 39.0"	13h 34m 33.26s	-09° 51' 43.6"	0.9961502	8.28	8.8	1926.7
20/10/2010	13h 38m 18.66s	-10° 13' 16.9"	13h 38m 18.78s	-10° 13' 21.5"	0.9958667	8.28	8.8	1927.2
21/10/2010	13h 42m 04.81s	-10° 34' 45.8"	13h 42m 04.94s	-10° 34' 50.4"	0.9955853	8.28	8.8	1927.8
22/10/2010	13h 45m 51.62s	-10° 56' 05.3"	13h 45m 51.74s	-10° 56' 09.8"	0.9953063	8.28	8.8	1928.3
23/10/2010	13h 49m 39.08s	-11° 17' 15.0"	13h 49m 39.21s	-11° 17' 19.5"	0.9950298	8.28	8.8	1928.9
24/10/2010	13h 53m 27.24s	-11° 38' 14.6"	13h 53m 27.37s	-11° 38' 19.1"	0.9947560	8.27	8.8	1929.4
25/10/2010	13h 57m 16.10s	-11° 59' 03.6"	13h 57m 16.22s	-11° 59' 08.1"	0.9944850	8.27	8.8	1929.9
26/10/2010	14h 01m 05.67s	-12° 19' 41.9"	14h 01m 05.80s	-12° 19' 46.2"	0.9942167	8.27	8.8	1930.4
27/10/2010	14h 04m 55.99s	-12° 40' 08.8"	14h 04m 56.12s	-12° 40' 13.1"	0.9939513	8.27	8.8	1930.9
28/10/2010	14h 08m 47.06s	-13° 00' 24.0"	14h 08m 47.19s	-13° 00' 28.3"	0.9936885	8.26	8.8	1931.5
29/10/2010	14h 12m 38.90s	-13° 20' 27.2"	14h 12m 39.03s	-13° 20' 31.5"	0.9934283	8.26	8.8	1932.0
30/10/2010	14h 16m 31.51s	-13° 40' 17.9"	14h 16m 31.64s	-13° 40' 22.1"	0.9931704	8.26	8.8	1932.5
31/10/2010	14h 20m 24.92s	-13° 59' 55.7"	14h 20m 25.05s	-13° 59' 59.9"	0.9929147	8.26	8.8	1933.0
01/11/2010	14h 24m 19.13s	-14° 19' 20.2"	14h 24m 19.26s	-14° 19' 24.3"	0.9926610	8.26	8.8	1933.5
02/11/2010	14h 28m 14.15s	-14° 38' 30.9"	14h 28m 14.28s	-14° 38' 35.0"	0.9924088	8.25	8.8	1933.9
03/11/2010	14h 32m 10.00s	-14° 57' 27.5"	14h 32m 10.13s	-14° 57' 31.6"	0.9921580	8.25	8.8	1934.4
04/11/2010	14h 36m 06.67s	-15° 16' 09.6"	14h 36m 06.80s	-15° 16' 13.6"	0.9919084	8.25	8.8	1934.9
05/11/2010	14h 40m 04.18s	-15° 34' 36.6"	14h 40m 04.31s	-15° 34' 40.5"	0.9916599	8.25	8.8	1935.4
06/11/2010	14h 44m 02.52s	-15° 52' 48.2"	14h 44m 02.65s	-15° 52' 52.1"	0.9914122	8.25	8.8	1935.9
07/11/2010	14h 48m 01.70s	-16° 10' 44.0"	14h 48m 01.84s	-16° 10' 47.8"	0.9911656	8.24	8.8	1936.4
08/11/2010	14h 52m 01.73s	-16° 28' 23.5"	14h 52m 01.86s	-16° 28' 27.3"	0.9909201	8.24	8.8	1936.9
09/11/2010	14h 56m 02.58s	-16° 45' 46.4"	14h 56m 02.71s	-16° 45' 50.2"	0.9906760	8.24	8.8	1937.3
10/11/2010	15h 00m 04.27s	-17° 02' 52.1"	15h 00m 04.40s	-17° 02' 55.9"	0.9904335	8.24	8.8	1937.8
11/11/2010	15h 04m 06.79s	-17° 19' 40.4"	15h 04m 06.92s	-17° 19' 44.2"	0.9901929	8.24	8.8	1938.3
12/11/2010	15h 08m 10.14s	-17° 36' 10.9"	15h 08m 10.27s	-17° 36' 14.6"	0.9899545	8.23	8.8	1938.7
13/11/2010	15h 12m 14.32s	-17° 52' 23.0"	15h 12m 14.46s	-17° 52' 26.6"	0.9897187	8.23	8.8	1939.2
14/11/2010	15h 16m 19.33s	-18° 08' 16.4"	15h 16m 19.46s	-18° 08' 20.0"	0.9894858	8.23	8.8	1939.7
15/11/2010	15h 20m 25.17s	-18° 23' 50.8"	15h 20m 25.30s	-18° 23' 54.4"	0.9892561	8.23	8.8	1940.1
16/11/2010	15h 24m 31.83s	-18° 39' 05.7"	15h 24m 31.96s	-18° 39' 09.2"	0.9890299	8.23	8.8	1940.6
17/11/2010	15h 28m 39.31s	-18° 54' 00.7"	15h 28m 39.44s	-18° 54' 04.3"	0.9888074	8.22	8.8	1941.0
18/11/2010	15h 32m 47.62s	-19° 08' 35.6"	15h 32m 47.75s	-19° 08' 39.1"	0.9885890	8.22	8.8	1941.4
19/11/2010	15h 36m 56.74s	-19° 22' 50.0"	15h 36m 56.88s	-19° 22' 53.4"	0.9883750	8.22	8.9	1941.8
20/11/2010	15h 41m 06.69s	-19° 36' 43.4"	15h 41m 06.82s	-19° 36' 46.8"	0.9881654	8.22	8.9	1942.3
21/11/2010	15h 45m 17.44s	-19° 50' 15.5"	15h 45m 17.57s	-19° 50' 18.9"	0.9879606	8.22	8.9	1942.7
22/11/2010	15h 49m 29.00s	-20° 03' 26.1"	15h 49m 29.13s	-20° 03' 29.4"	0.9877608	8.21	8.9	1943.0
23/11/2010	15h 53m 41.36s	-20° 16' 14.7"	15h 53m 41.49s	-20° 16' 18.0"	0.9875659	8.21	8.9	1943.4
24/11/2010	15h 57m 54.51s	-20° 28' 40.9"	15h 57m 54.64s	-20° 28' 44.2"	0.9873761	8.21	8.9	1943.8
25/11/2010	16h 02m 08.44s	-20° 40' 44.6"	16h 02m 08.57s	-20° 40' 47.8"	0.9871914	8.21	8.9	1944.2
26/11/2010	16h 06m 23.15s	-20° 52' 25.2"	16h 06m 23.28s	-20° 52' 28.4"	0.9870115	8.21	8.9	1944.5
27/11/2010	16h 10m 38.61s	-21° 03' 42.5"	16h 10m 38.74s	-21° 03' 45.7"	0.9868365	8.21	8.9	1944.9
28/11/2010	16h 14m 54.82s	-21° 14' 36.1"	16h 14m 54.94s	-21° 14' 39.3"	0.9866661	8.21	8.9	1945.2
29/11/2010	16h 19m 11.75s	-21° 25' 05.7"	16h 19m 11.88s	-21° 25' 08.9"	0.9864999	8.20	8.9	1945.5
30/11/2010	16h 23m 29.41s	-21° 35' 11.0"	16h 23m 29.53s	-21° 35' 14.1"	0.9863378	8.20	8.9	1945.8
01/12/2010	16h 27m 47.76s	-21° 44' 51.6"	16h 27m 47.88s	-21° 44' 54.7"	0.9861794	8.20	8.9	1946.2
02/12/2010	16h 32m 06.78s	-21° 54' 07.3"	16h 32m 06.91s	-21° 54' 10.4"	0.9860244	8.20	8.9	1946.5
03/12/2010	16h 36m 26.46s	-22° 02' 57.7"	16h 36m 26.58s	-22° 03' 00.8"	0.9858727	8.20	8.9	1946.8
04/12/2010	16h 40m 46.76s	-22° 11' 22.7"	16h 40m 46.89s	-22° 11' 25.8"	0.9857241	8.20	8.9	1947.1
05/12/2010	16h 45m 07.67s	-22° 19' 21.9"	16h 45m 07.79s	-22° 19' 25.0"	0.9855784	8.20	8.9	1947.3
06/12/2010	16h 49m 29.14s	-22° 26' 55.1"	16h 49m 29.26s	-22° 26' 58.2"	0.9854356	8.20	8.9	1947.6
07/12/2010	16h 53m 51.15s	-22° 34' 02.1"	16h 53m 51.27s	-22° 34' 05.1"	0.9852959	8.19	8.9	1947.9
08/12/2010	16h 58m 13.66s	-22° 40' 42.6"	16h 58m 13.78s	-22° 40' 45.6"	0.9851593	8.19	8.9	1948.2
09/12/2010	17h 02m 36.64s	-22° 46' 56.5"	17h 02m 36.76s	-22° 46' 59.5"	0.9850260	8.19	8.9	1948.4
10/12/2010	17h 07m 00.06s	-22° 52' 43.4"	17h 07m 00.18s	-22° 52' 46.4"	0.9848962	8.19	8.9	1948.7
11/12/2010	17h 11m 23.89s	-22° 58' 03.3"	17h 11m 24.00s	-22° 58' 06.3"	0.9847702	8.19	8.9	1948.9
12/12/2010	17h 15m 48.09s	-23° 02' 55.9"	17h 15m 48.21s	-23° 02' 58.9"	0.9846483	8.19	8.9	1949.2
13/12/2010	17h 20m 12.64s	-23° 07' 21.1"	17h 20m 12.75s	-23° 07' 24.1"	0.9845306	8.19	8.9	1949.4
14/12/2010	17h 24m 37.50s	-23° 11' 18.8"	17h 24m 37.61s	-23° 11' 21.7"	0.9844176	8.19	8.9	1949.6
15/12/2010	17h 29m 02.64s	-23° 14' 48.8"	17h 29m 02.76s	-23° 14' 51.7"	0.9843093	8.19	8.9	1949.9
16/12/2010	17h 33m 28.04s	-23° 17' 51.0"	17h 33m 28.15s	-23° 17' 53.8"	0.9842062	8.19	8.9	1950.1
17/12/2010	17h 37m 53.66s	-23° 20' 25.2"	17h 37m 53.77s	-23° 20' 28.1"	0.9841084	8.18	8.9	1950.3
18/12/2010	17h 42m 19.47s	-23° 22' 31.5"	17h 42m 19.58s	-23° 22' 34.4"	0.9840162	8.18	8.9	1950.4
19/12/2010	17h 46m 45.44s	-23° 24' 09.8"	17h 46m 45.56s	-23° 24' 12.7"	0.9839299	8.18	8.9	1950.6
20/12/2010	17h 51m 11.55s	-23° 25' 20.0"	17h 51m 11.66s	-23° 25' 22.8"	0.9838497	8.18	8.9	1950.8
21/12/2010	17h 55m 37.75s	-23° 26' 02.0"	17h 55m 37.86s	-23° 26' 04.8"	0.9837757	8.18	8.9	1950.9
22/12/2010	18h 00m 04.02s	-23° 26' 15.8"	18h 00m 04.13s	-23° 26' 18.7"	0.9837081	8.18	8.9	1951.1
23/12/2010	18h 04m 30.33s	-23° 26' 01.4"	18h 04m 30.44s	-23° 26' 04.3"	0.9836470	8.18	8.9	1951.2
24/12/2010	18h 08m 56.64s	-23° 25' 18.8"	18h 08m 56.75s	-23° 25' 21.7"	0.9835922	8.18	8.9	1951.3
25/12/2010	18h 13m 22.93s	-23° 24' 08.0"	18h 13m 23.04s	-23° 24' 10.8"	0.9835436	8.18	8.9	1951.4
26/12/2010	18h 17m 49.17s	-23° 22' 28.9"	18h 17m 49.27s	-23° 22' 31.8"	0.9835011	8.18	8.9	1951.5
27/12/2010	18h 22m 15.32s	-23° 20' 21.6"	18h 22m 15.42s	-23° 20' 24.5"	0.9834643	8.18	8.9	1951.5
28/12/2010	18h 26m 41.36s	-23° 17' 46.1"	18h 26m 41.46s	-23° 17' 49.0"	0.9834330	8.18	8.9	1951.6
29/12/2010	18h 31m 07.25s	-23° 14' 42.5"	18h 31m 07.35s	-23° 14' 45.4"	0.9834068	8.18	8.9	1951.6
30/12/2010	18h 35m 32.96s	-23° 11' 10.9"	18h 35m 33.06s	-23° 11' 13.8"	0.9833854	8.18	8.9	1951.7
31/12/2010	18h 39m 58.47s	-23° 07' 11.4"	18h 39m 58.57s	-23° 07' 14.3"	0.9833685	8.18	8.9	1951.7

Date = data nel formato gg/mm/aaaa

A.R. e DEC. = coordinate apparenti geocentriche e topocentriche per Roma (42°N, 12°E)

Distance = distanza in U.A.

Light = distanza in minuti-luce

Parall. = parallasse in "

Diam. = diametro in "

Date = date in the format dd/mm/yyyy  
A.R. e DEC. = geocentric and topocentric apparent coordinates for Rome (42°N, 12°E)  
Distance = distance in A.U.  
Light = distance in minutes  
Parall. = parallax in "  
Diam. = diameter in "

## TRANSITI DEL MERIDIANO CENTRALE TRANSITS OF THE SOLAR CENTRAL MERIDIAN

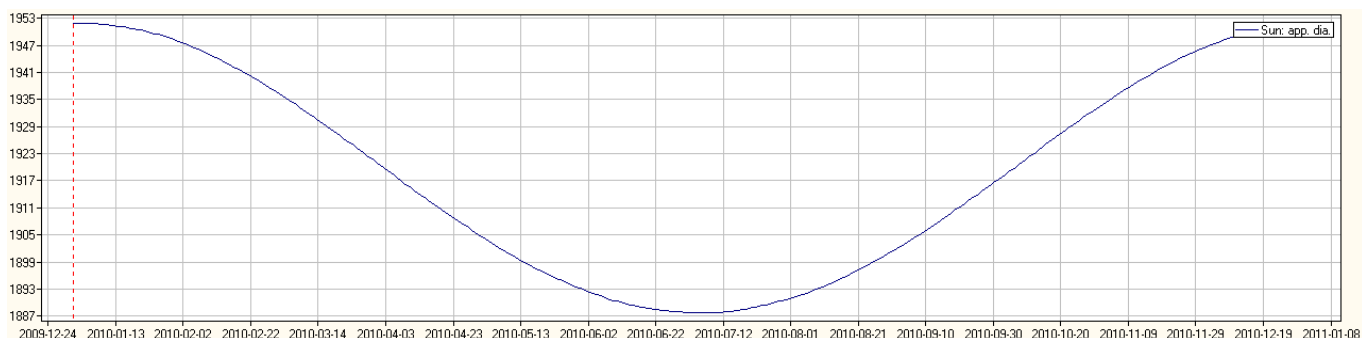
03/01/10	12.51	22/04/10	19.20	09/08/10	15.44	26/11/10	18.28
30/01/10	21.00	20/05/10	00.55	05/09/10	21.34	24/12/10	02.11
27/02/10	05.08	16/06/10	05.48	03/10/10	04.05		
26/03/10	12.44	13/07/10	10.34	30/10/10	11.06		

## SOLSTIZI ED EQUINOZI - SOLSTICES AND EQUINOXES

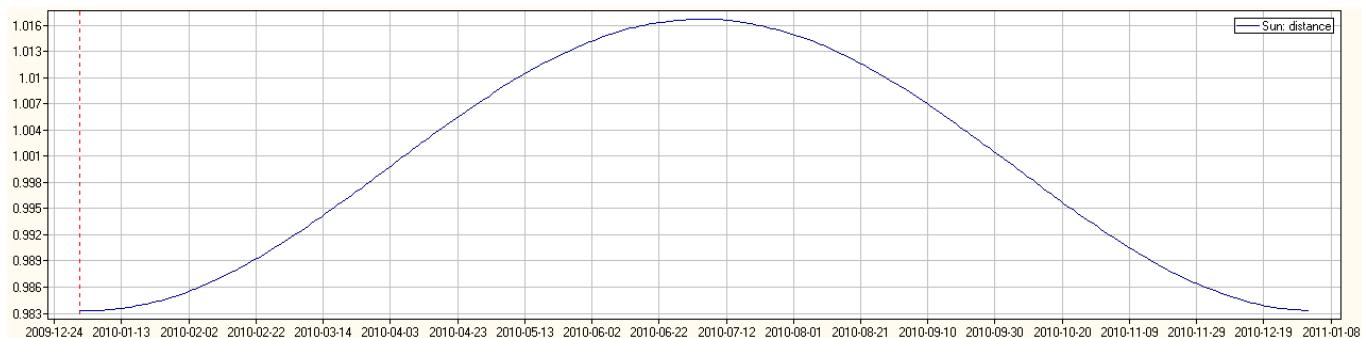
Equinozio di primavera- Spring equinox	20/03	17.32.17
Solstizio d'estate- Summer solstice	21/06	11.28.29
Equinozio d'autunno- Autumn equinox	23/09	03.09.06
Solstizio d'inverno- Winter solstice	21/12	23.38.32

## PERIGEO ED APOGEO - PERIGEE AND APOGEE

Perigeo - Perigee	03/01	00.09.58	0.98329 U.A.
Apogeo - Apogee	06/07	10.48.31	1.01670 U.A.



Diametro del Sole in " nel corso dell'anno - Diameter of the Sun in " during the year



Distanza del Sole in U.A. nel corso dell'anno - Distance of the Sun in A.U. during the year

# EFFEMERIDI FISICHE DEL SOLE

## PHYSICAL EPHEMERIDES OF THE SUN

Date year mth d	Po o	Bo o	LoCarring. o Rotat.	Date year mth d	Po o	Bo o	LoCarring. o Rotat.	Date year mth d	Po o	Bo o	LoCarring. o Rotat.
2010 01 1	2.10	-3.01	32.98 2091	2010 05 3	336.21	-3.99	224.89 2096	2010 09 6	22.22	7.24	358.26 2101
2010 01 3	1.13	-3.24	6.64 2091	2010 05 7	337.02	-3.57	172.01 2096	2010 09 8	22.66	7.25	331.85 2101
2010 01 5	0.16	-3.47	340.30 2092	2010 05 9	337.48	-3.35	145.57 2096	2010 09 10	23.08	7.25	305.44 2101
2010 01 7	359.19	-3.69	313.96 2092	2010 05 11	337.95	-3.14	119.12 2096	2010 09 12	23.48	7.24	279.03 2101
2010 01 9	358.23	-3.91	287.63 2092	2010 05 13	338.46	-2.91	92.68 2096	2010 09 14	23.84	7.22	252.62 2101
2010 01 11	357.27	-4.13	261.29 2092	2010 05 15	338.99	-2.69	66.23 2096	2010 09 16	24.19	7.20	226.22 2101
2010 01 13	356.32	-4.34	234.95 2092	2010 05 17	339.55	-2.46	39.77 2096	2010 09 18	24.51	7.16	199.81 2101
2010 01 15	355.38	-4.54	208.62 2092	2010 05 19	340.14	-2.23	13.32 2096	2010 09 20	24.80	7.12	173.41 2101
2010 01 17	354.45	-4.74	182.28 2092	2010 05 21	340.75	-2.00	346.86 2097	2010 09 22	25.07	7.07	147.01 2101
2010 01 19	353.53	-4.93	155.95 2092	2010 05 23	341.38	-1.76	320.41 2097	2010 09 24	25.32	7.00	120.61 2101
2010 01 21	352.62	-5.12	129.62 2092	2010 05 25	342.04	-1.53	293.95 2097	2010 09 26	25.53	6.94	94.22 2101
2010 01 23	351.72	-5.29	103.28 2092	2010 05 27	342.72	-1.29	267.48 2097	2010 09 28	25.72	6.86	67.82 2101
2010 01 25	350.84	-5.47	76.95 2092	2010 05 29	343.42	-1.05	241.02 2097	2010 09 30	25.88	6.78	41.43 2101
2010 01 27	349.97	-5.63	50.62 2092	2010 05 31	344.15	-0.81	214.55 2097	2010 10 2	26.02	6.68	15.04 2101
2010 01 29	349.12	-5.79	24.28 2092	2010 06 2	344.89	-0.57	188.09 2097	2010 10 4	26.13	6.58	348.65 2102
2010 01 31	348.29	-5.94	357.95 2093	2010 06 4	345.65	-0.33	161.62 2097	2010 10 6	26.21	6.47	322.26 2102
2010 02 2	347.47	-6.09	331.62 2093	2010 06 6	346.44	-0.09	135.15 2097	2010 10 8	26.26	6.36	295.87 2102
2010 02 4	346.67	-6.22	305.29 2093	2010 06 8	347.23	0.15	108.68 2097	2010 10 10	26.28	6.23	269.49 2102
2010 02 6	345.89	-6.35	278.95 2093	2010 06 10	348.05	0.40	82.21 2097	2010 10 12	26.27	6.10	243.10 2102
2010 02 8	345.13	-6.47	252.62 2093	2010 06 12	348.88	0.64	55.74 2097	2010 10 14	26.23	5.96	216.72 2102
2010 02 10	344.40	-6.58	226.29 2093	2010 06 14	349.72	0.88	29.26 2097	2010 10 16	26.16	5.81	190.34 2102
2010 02 12	343.68	-6.69	199.95 2093	2010 06 16	350.57	1.12	2.79 2097	2010 10 18	26.07	5.66	163.96 2102
2010 02 14	342.98	-6.78	173.62 2093	2010 06 18	351.44	1.35	336.32 2098	2010 10 20	25.94	5.50	137.58 2102
2010 02 16	342.31	-6.87	147.28 2093	2010 06 20	352.31	1.59	309.84 2098	2010 10 22	25.78	5.33	111.20 2102
2010 02 18	341.66	-6.95	120.95 2093	2010 06 22	353.20	1.82	283.37 2098	2010 10 24	25.59	5.16	84.82 2102
2010 02 20	341.03	-7.01	94.61 2093	2010 06 24	354.09	2.06	256.90 2098	2010 10 26	25.37	4.98	58.45 2102
2010 02 22	340.43	-7.07	68.27 2093	2010 06 26	354.99	2.29	230.42 2098	2010 10 28	25.12	4.79	32.07 2102
2010 02 24	339.85	-7.13	41.93 2093	2010 06 28	355.89	2.51	203.95 2098	2010 10 30	24.83	4.60	5.70 2102
2010 02 26	339.29	-7.17	15.59 2093	2010 06 30	356.79	2.74	177.48 2098	2010 11 1	24.52	4.40	339.32 2103
2010 02 28	338.76	-7.20	349.24 2094	2010 07 2	357.70	2.96	151.00 2098	2010 11 3	24.17	4.20	312.95 2103
2010 03 2	338.26	-7.23	322.90 2094	2010 07 4	358.61	3.18	124.53 2098	2010 11 5	23.79	3.99	286.58 2103
2010 03 4	337.78	-7.24	296.55 2094	2010 07 6	359.51	3.39	98.06 2098	2010 11 7	23.39	3.77	260.21 2103
2010 03 6	337.32	-7.25	270.20 2094	2010 07 8	0.42	3.60	71.59 2098	2010 11 9	22.95	3.56	233.84 2103
2010 03 8	336.89	-7.25	243.85 2094	2010 07 10	1.32	3.81	45.12 2098	2010 11 11	22.47	3.33	207.47 2103
2010 03 10	336.49	-7.24	217.50 2094	2010 07 12	2.22	4.01	18.65 2098	2010 11 13	21.97	3.10	181.11 2103
2010 03 12	336.11	-7.22	191.14 2094	2010 07 14	3.11	4.21	352.19 2099	2010 11 15	21.44	2.87	154.74 2103
2010 03 14	335.76	-7.19	164.79 2094	2010 07 16	4.00	4.41	325.72 2099	2010 11 17	20.88	2.64	128.37 2103
2010 03 16	335.44	-7.15	138.43 2094	2010 07 18	4.88	4.60	299.26 2099	2010 11 19	20.29	2.40	102.01 2103
2010 03 18	335.14	-7.11	112.06 2094	2010 07 20	5.75	4.78	272.79 2099	2010 11 21	19.67	2.16	75.65 2103
2010 03 20	334.88	-7.05	85.70 2094	2010 07 22	6.61	4.96	246.33 2099	2010 11 23	19.02	1.91	49.28 2103
2010 03 22	334.64	-6.99	59.33 2094	2010 07 24	7.47	5.13	219.87 2099	2010 11 25	18.34	1.66	22.92 2103
2010 03 24	334.42	-6.92	32.96 2094	2010 07 26	8.31	5.30	193.42 2099	2010 11 27	17.64	1.41	356.56 2104
2010 03 26	334.24	-6.84	6.59 2094	2010 07 28	9.14	5.46	166.96 2099	2010 11 29	16.91	1.16	330.20 2104
2010 03 28	334.08	-6.75	340.21 2095	2010 07 30	9.95	5.62	140.50 2099	2010 12 1	16.15	0.91	303.85 2104
2010 03 30	333.95	-6.66	313.83 2095	2010 08 1	10.75	5.77	114.05 2099	2010 12 3	15.37	0.65	277.49 2104
2010 04 1	333.85	-6.55	287.45 2095	2010 08 3	11.54	5.91	87.60 2099	2010 12 5	14.57	0.40	251.13 2104
2010 04 3	333.78	-6.44	261.06 2095	2010 08 5	12.32	6.05	61.15 2099	2010 12 7	13.75	0.14	224.78 2104
2010 04 5	333.74	-6.33	234.67 2095	2010 08 7	13.08	6.18	34.71 2099	2010 12 9	12.90	-0.11	198.42 2104
2010 04 7	333.72	-6.20	208.28 2095	2010 08 9	13.82	6.30	8.26 2099	2010 12 11	12.04	-0.37	172.07 2104
2010 04 9	333.74	-6.07	181.88 2095	2010 08 11	14.54	6.42	341.82 2100	2010 12 13	11.16	-0.63	145.72 2104
2010 04 11	333.78	-5.93	155.48 2095	2010 08 13	15.25	6.53	315.38 2100	2010 12 15	10.27	-0.88	119.37 2104
2010 04 13	333.85	-5.78	129.08 2095	2010 08 15	15.94	6.63	288.94 2100	2010 12 17	9.35	-1.14	93.02 2104
2010 04 15	333.96	-5.63	102.68 2095	2010 08 17	16.61	6.73	262.50 2100	2010 12 19	8.43	-1.39	66.67 2104
2010 04 17	334.09	-5.47	76.27 2095	2010 08 19	17.27	6.81	236.07 2100	2010 12 21	7.50	-1.64	40.32 2104
2010 04 19	334.25	-5.30	49.86 2095	2010 08 21	17.90	6.89	209.64 2100	2010 12 23	6.55	-1.89	13.98 2104
2010 04 21	334.44	-5.13	23.44 2095	2010 08 23	18.51	6.97	183.21 2100	2010 12 25	5.60	-2.14	347.63 2105
2010 04 23	334.66	-4.95	357.02 2096	2010 08 25	19.11	7.03	156.78 2100	2010 12 27	4.64	-2.38	321.29 2105
2010 04 25	334.91	-4.77	330.60 2096	2010 08 27	19.68	7.09	130.36 2100	2010 12 29	3.67	-2.62	294.94 2105
2010 04 27	335.19	-4.58	304.18 2096	2010 08 29	20.23	7.13	103.93 2100	2010 12 31	2.70	-2.86	268.60 2105
2010 04 29	335.50	-4.39	277.75 2096	2010 08 31	20.76	7.17	77.51 2100				
2010 05 1	335.84	-4.19	251.32 2096	2010 09 2	21.27	7.21	51.09 2100				
2010 05 5	336.60	-3.78	198.45 2096	2010 09 4	21.76	7.23	24.68 2100				

Moto del meridiano centrale - Motion of the central meridian

Day	0h	3h	6h	9h	12h	15h	18h	21h	24h
0	0.0	1.7	3.3	5.0	6.6	8.3	9.9	11.6	13.2
1	13.2	14.9	16.5	18.2	19.8	21.5	23.1	24.8	26.4
2	26.4	28.1	29.7	31.4	33.0	34.7	36.3	38.0	39.6

Date = data nel formato anno/mese/giorno  
Day = giorni  
Po = angolo di posizione del polo nord del Sole, in °  
Bo = latitudine della Terra, riferita all'equatore del Sole, in °  
Lo = longitudine del meridiano centrale del Sole, in °

Po = position angle of the north pole of the Sun, in °  
Bo = latitude of the Earth, referred to the solar equator, in °  
Lo = longitude of the central meridian of the Sun, in °

# LEVATA E TRAMONTO DEL SOLE - SUNRISE AND SUNSET

for Greenwich Meridian			for Rome :			Longitude E 12 00.0		
						Latitude N 42 00.0		
						Time Zone UT +1		
Date	Ephemeris TDT JD	Transit TDT Time	Rise (Azm)			Trans (Alt)		
			h	m	s	h	m	s
2010-01- 1	2455198.002456	12 03 32.2	7 40	(121)		12 16	(25)	16 51 (239)
2010-01- 2	2455199.002780	12 04 00.2	7 40	(121)		12 16	(25)	16 52 (239)
2010-01- 3	2455200.003100	12 04 27.8	7 40	(121)		12 16	(25)	16 53 (239)
2010-01- 4	2455201.003415	12 04 55.1	7 40	(120)		12 17	(25)	16 54 (240)
2010-01- 5	2455202.003727	12 05 22.0	7 40	(120)		12 17	(25)	16 55 (240)
2010-01- 6	2455203.004033	12 05 48.5	7 40	(120)		12 18	(26)	16 56 (240)
2010-01- 7	2455204.004334	12 06 14.5	7 40	(120)		12 18	(26)	16 57 (240)
2010-01- 8	2455205.004630	12 06 40.0	7 40	(120)		12 19	(26)	16 58 (240)
2010-01- 9	2455206.004920	12 07 05.1	7 40	(120)		12 19	(26)	16 59 (241)
2010-01-10	2455207.005204	12 07 29.6	7 39	(119)		12 19	(26)	17 00 (241)
2010-01-11	2455208.005481	12 07 53.6	7 39	(119)		12 20	(26)	17 01 (241)
2010-01-12	2455209.005752	12 08 17.0	7 39	(119)		12 20	(26)	17 02 (241)
2010-01-13	2455210.006015	12 08 39.7	7 38	(119)		12 21	(27)	17 03 (241)
2010-01-14	2455211.006272	12 09 01.9	7 38	(118)		12 21	(27)	17 04 (242)
2010-01-15	2455212.006521	12 09 23.4	7 38	(118)		12 21	(27)	17 05 (242)
2010-01-16	2455213.006762	12 09 44.2	7 37	(118)		12 22	(27)	17 07 (242)
2010-01-17	2455214.006995	12 10 04.3	7 37	(118)		12 22	(27)	17 08 (242)
2010-01-18	2455215.007219	12 10 23.8	7 36	(117)		12 22	(28)	17 09 (243)
2010-01-19	2455216.007436	12 10 42.4	7 36	(117)		12 23	(28)	17 10 (243)
2010-01-20	2455217.007643	12 11 00.4	7 35	(117)		12 23	(28)	17 11 (243)
2010-01-21	2455218.007842	12 11 17.5	7 34	(116)		12 23	(28)	17 13 (244)
2010-01-22	2455219.008031	12 11 33.9	7 34	(116)		12 24	(28)	17 14 (244)
2010-01-23	2455220.008212	12 11 49.5	7 33	(116)		12 24	(29)	17 15 (244)
2010-01-24	2455221.008383	12 12 04.3	7 32	(115)		12 24	(29)	17 16 (245)
2010-01-25	2455222.008545	12 12 18.3	7 31	(115)		12 24	(29)	17 18 (245)
2010-01-26	2455223.008697	12 12 31.5	7 31	(115)		12 25	(29)	17 19 (245)
2010-01-27	2455224.008840	12 12 43.8	7 30	(114)		12 25	(30)	17 20 (246)
2010-01-28	2455225.008974	12 12 55.3	7 29	(114)		12 25	(30)	17 21 (246)
2010-01-29	2455226.009098	12 13 06.0	7 28	(114)		12 25	(30)	17 23 (246)
2010-01-30	2455227.009212	12 13 15.9	7 27	(113)		12 25	(30)	17 24 (247)
2010-01-31	2455228.009317	12 13 25.0	7 26	(113)		12 25	(31)	17 25 (247)
2010-02- 1	2455229.009413	12 13 33.3	7 25	(113)		12 26	(31)	17 27 (248)
2010-02- 2	2455230.009499	12 13 40.7	7 24	(112)		12 26	(31)	17 28 (248)
2010-02- 3	2455231.009576	12 13 47.4	7 23	(112)		12 26	(32)	17 29 (248)
2010-02- 4	2455232.009644	12 13 53.3	7 22	(111)		12 26	(32)	17 30 (249)
2010-02- 5	2455233.009703	12 13 58.3	7 21	(111)		12 26	(32)	17 32 (249)
2010-02- 6	2455234.009753	12 14 02.6	7 20	(110)		12 26	(32)	17 33 (250)
2010-02- 7	2455235.009793	12 14 06.1	7 18	(110)		12 26	(33)	17 34 (250)
2010-02- 8	2455236.009825	12 14 08.9	7 17	(110)		12 26	(33)	17 36 (251)
2010-02- 9	2455237.009847	12 14 10.8	7 16	(109)		12 26	(33)	17 37 (251)
2010-02-10	2455238.009861	12 14 12.0	7 15	(109)		12 26	(34)	17 38 (251)
2010-02-11	2455239.009866	12 14 12.4	7 14	(108)		12 26	(34)	17 39 (252)
2010-02-12	2455240.009862	12 14 12.1	7 12	(108)		12 26	(34)	17 41 (252)
2010-02-13	2455241.009850	12 14 11.0	7 11	(107)		12 26	(35)	17 42 (253)
2010-02-14	2455242.009828	12 14 09.2	7 10	(107)		12 26	(35)	17 43 (253)
2010-02-15	2455243.009799	12 14 06.6	7 08	(106)		12 26	(35)	17 45 (254)
2010-02-16	2455244.009761	12 14 03.3	7 07	(106)		12 26	(36)	17 46 (254)
2010-02-17	2455245.009715	12 13 59.3	7 06	(105)		12 26	(36)	17 47 (255)
2010-02-18	2455246.009660	12 13 54.6	7 04	(105)		12 26	(36)	17 48 (255)
2010-02-19	2455247.009597	12 13 49.2	7 03	(105)		12 26	(37)	17 50 (256)
2010-02-20	2455248.009527	12 13 43.1	7 01	(104)		12 26	(37)	17 51 (256)
2010-02-21	2455249.009449	12 13 36.4	7 00	(104)		12 26	(37)	17 52 (257)
2010-02-22	2455250.009363	12 13 29.0	6 58	(103)		12 25	(38)	17 53 (257)
2010-02-23	2455251.009270	12 13 20.9	6 57	(103)		12 25	(38)	17 55 (258)
2010-02-24	2455252.009169	12 13 12.2	6 55	(102)		12 25	(39)	17 56 (258)
2010-02-25	2455253.009062	12 13 02.9	6 54	(102)		12 25	(39)	17 57 (259)
2010-02-26	2455254.008947	12 12 53.1	6 52	(101)		12 25	(39)	17 58 (259)
2010-02-27	2455255.008827	12 12 42.6	6 51	(101)		12 25	(40)	17 59 (260)
2010-02-28	2455256.008699	12 12 31.6	6 49	(100)		12 25	(40)	18 01 (260)
2010-03- 1	2455257.008566	12 12 20.1	6 48	(100)		12 24	(40)	18 02 (261)
2010-03- 2	2455258.008427	12 12 08.1	6 46	( 99)		12 24	(41)	18 03 (261)
2010-03- 3	2455259.008283	12 11 55.6	6 44	( 98)		12 24	(41)	18 04 (262)
2010-03- 4	2455260.008133	12 11 42.7	6 43	( 98)		12 24	(42)	18 05 (262)
2010-03- 5	2455261.007978	12 11 29.3	6 41	( 97)		12 23	(42)	18 07 (263)
2010-03- 6	2455262.007818	12 11 15.5	6 39	( 97)		12 23	(42)	18 08 (263)
2010-03- 7	2455263.007654	12 11 01.3	6 38	( 96)		12 23	(43)	18 09 (264)
2010-03- 8	2455264.007485	12 10 46.7	6 36	( 96)		12 23	(43)	18 10 (264)
2010-03- 9	2455265.007313	12 10 31.8	6 34	( 95)		12 23	(44)	18 11 (265)
2010-03-10	2455266.007136	12 10 16.6	6 33	( 95)		12 22	(44)	18 12 (265)
2010-03-11	2455267.006956	12 10 01.0	6 31	( 94)		12 22	(44)	18 14 (266)
2010-03-12	2455268.006773	12 09 45.2	6 29	( 94)		12 22	(45)	18 15 (266)
2010-03-13	2455269.006586	12 09 29.0	6 28	( 93)		12 21	(45)	18 16 (267)
2010-03-14	2455270.006396	12 09 12.6	6 26	( 93)		12 21	(46)	18 17 (268)
2010-03-15	2455271.006203	12 08 56.0	6 24	( 92)		12 21	(46)	18 18 (268)

Date	TDT JD	TDT Time	Rise (AzM)	Trans (Alt)	Set (AzM)
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2010-03-17	2455273.005810	12 08 22.0	6 21 ( 91)	12 20 (47)	18 20 (269)
2010-03-18	2455274.005610	12 08 04.7	6 19 ( 91)	12 20 (47)	18 22 (270)
2010-03-19	2455275.005408	12 07 47.3	6 18 ( 90)	12 20 (48)	18 23 (270)
2010-03-20	2455276.005204	12 07 29.6	6 16 ( 90)	12 20 (48)	18 24 (271)
2010-03-21	2455277.004999	12 07 11.9	6 14 ( 89)	12 19 (48)	18 25 (271)
2010-03-22	2455278.004791	12 06 54.0	6 12 ( 88)	12 19 (49)	18 26 (272)
2010-03-23	2455279.004583	12 06 36.0	6 11 ( 88)	12 19 (49)	18 27 (272)
2010-03-24	2455280.004374	12 06 17.9	6 09 ( 87)	12 18 (49)	18 28 (273)
2010-03-25	2455281.004164	12 05 59.8	6 07 ( 87)	12 18 (50)	18 30 (273)
2010-03-26	2455282.003954	12 05 41.6	6 06 ( 86)	12 18 (50)	18 31 (274)
2010-03-27	2455283.003743	12 05 23.4	6 04 ( 86)	12 17 (51)	18 32 (274)
2010-03-28	2455284.003533	12 05 05.2	6 02 ( 85)	12 17 (51)	18 33 (275)
2010-03-29	2455285.003322	12 04 47.0	6 00 ( 85)	12 17 (51)	18 34 (276)
2010-03-30	2455286.003112	12 04 28.9	5 59 ( 84)	12 16 (52)	18 35 (276)
2010-03-31	2455287.002903	12 04 10.9	5 57 ( 84)	12 16 (52)	18 36 (277)
2010-04- 1	2455288.002696	12 03 52.9	5 55 ( 83)	12 16 (53)	18 37 (277)
2010-04- 2	2455289.002489	12 03 35.1	5 54 ( 83)	12 16 (53)	18 38 (278)
2010-04- 3	2455290.002284	12 03 17.4	5 52 ( 82)	12 15 (53)	18 40 (278)
2010-04- 4	2455291.002082	12 02 59.9	5 50 ( 82)	12 15 (54)	18 41 (279)
2010-04- 5	2455292.001881	12 02 42.5	5 48 ( 81)	12 15 (54)	18 42 (279)
2010-04- 6	2455293.001683	12 02 25.4	5 47 ( 81)	12 14 (55)	18 43 (280)
2010-04- 7	2455294.001487	12 02 08.4	5 45 ( 80)	12 14 (55)	18 44 (280)
2010-04- 8	2455295.001294	12 01 51.8	5 43 ( 80)	12 14 (55)	18 45 (281)
2010-04- 9	2455296.001104	12 01 35.3	5 42 ( 79)	12 14 (56)	18 46 (281)
2010-04-10	2455297.000917	12 01 19.2	5 40 ( 79)	12 13 (56)	18 47 (282)
2010-04-11	2455298.000733	12 01 03.3	5 39 ( 78)	12 13 (56)	18 48 (282)
2010-04-12	2455299.000553	12 00 47.8	5 37 ( 78)	12 13 (57)	18 49 (283)
2010-04-13	2455300.000376	12 00 32.5	5 35 ( 77)	12 13 (57)	18 51 (283)
2010-04-14	2455301.000204	12 00 17.6	5 34 ( 77)	12 12 (57)	18 52 (284)
2010-04-15	2455302.000035	12 00 03.0	5 32 ( 76)	12 12 (58)	18 53 (284)
2010-04-16	2455302.999870	11 59 48.8	5 30 ( 76)	12 12 (58)	18 54 (285)
2010-04-17	2455303.999710	11 59 34.9	5 29 ( 75)	12 12 (59)	18 55 (285)
2010-04-18	2455304.999554	11 59 21.4	5 27 ( 75)	12 11 (59)	18 56 (286)
2010-04-19	2455305.999402	11 59 08.3	5 26 ( 74)	12 11 (59)	18 57 (286)
2010-04-20	2455306.999255	11 58 55.6	5 24 ( 74)	12 11 (60)	18 58 (287)
2010-04-21	2455307.999112	11 58 43.3	5 23 ( 73)	12 11 (60)	18 59 (287)
2010-04-22	2455308.998975	11 58 31.4	5 21 ( 73)	12 11 (60)	19 01 (287)
2010-04-23	2455309.998842	11 58 20.0	5 20 ( 72)	12 10 (61)	19 02 (288)
2010-04-24	2455310.998715	11 58 09.0	5 18 ( 72)	12 10 (61)	19 03 (288)
2010-04-25	2455311.998593	11 57 58.4	5 17 ( 71)	12 10 (61)	19 04 (289)
2010-04-26	2455312.998476	11 57 48.3	5 15 ( 71)	12 10 (62)	19 05 (289)
2010-04-27	2455313.998365	11 57 38.7	5 14 ( 71)	12 10 (62)	19 06 (290)
2010-04-28	2455314.998260	11 57 29.6	5 13 ( 70)	12 09 (62)	19 07 (290)
2010-04-29	2455315.998160	11 57 21.1	5 11 ( 70)	12 09 (63)	19 08 (291)
2010-04-30	2455316.998067	11 57 13.0	5 10 ( 69)	12 09 (63)	19 09 (291)
2010-05- 1	2455317.997980	11 57 05.5	5 08 ( 69)	12 09 (63)	19 11 (291)
2010-05- 2	2455318.997899	11 56 58.5	5 07 ( 68)	12 09 (63)	19 12 (292)
2010-05- 3	2455319.997825	11 56 52.1	5 06 ( 68)	12 09 (64)	19 13 (292)
2010-05- 4	2455320.997757	11 56 46.2	5 04 ( 68)	12 09 (64)	19 14 (293)
2010-05- 5	2455321.997696	11 56 40.9	5 03 ( 67)	12 09 (64)	19 15 (293)
2010-05- 6	2455322.997642	11 56 36.3	5 02 ( 67)	12 09 (65)	19 16 (294)
2010-05- 7	2455323.997594	11 56 32.1	5 01 ( 66)	12 09 (65)	19 17 (294)
2010-05- 8	2455324.997553	11 56 28.6	5 00 ( 66)	12 08 (65)	19 18 (294)
2010-05- 9	2455325.997519	11 56 25.6	4 58 ( 66)	12 08 (65)	19 19 (295)
2010-05-10	2455326.997492	11 56 23.3	4 57 ( 65)	12 08 (66)	19 20 (295)
2010-05-11	2455327.997471	11 56 21.5	4 56 ( 65)	12 08 (66)	19 21 (295)
2010-05-12	2455328.997457	11 56 20.3	4 55 ( 64)	12 08 (66)	19 22 (296)
2010-05-13	2455329.997450	11 56 19.7	4 54 ( 64)	12 08 (66)	19 23 (296)
2010-05-14	2455330.997450	11 56 19.7	4 53 ( 64)	12 08 (67)	19 24 (296)
2010-05-15	2455331.997456	11 56 20.2	4 52 ( 63)	12 08 (67)	19 25 (297)
2010-05-16	2455332.997469	11 56 21.3	4 51 ( 63)	12 08 (67)	19 26 (297)
2010-05-17	2455333.997488	11 56 22.9	4 50 ( 63)	12 08 (67)	19 27 (297)
2010-05-18	2455334.997513	11 56 25.1	4 49 ( 62)	12 08 (68)	19 28 (298)
2010-05-19	2455335.997544	11 56 27.8	4 48 ( 62)	12 08 (68)	19 29 (298)
2010-05-20	2455336.997582	11 56 31.1	4 47 ( 62)	12 09 (68)	19 30 (298)
2010-05-21	2455337.997626	11 56 34.8	4 46 ( 62)	12 09 (68)	19 31 (299)
2010-05-22	2455338.997675	11 56 39.1	4 46 ( 61)	12 09 (68)	19 32 (299)
2010-05-23	2455339.997730	11 56 43.9	4 45 ( 61)	12 09 (69)	19 33 (299)
2010-05-24	2455340.997791	11 56 49.2	4 44 ( 61)	12 09 (69)	19 34 (299)
2010-05-25	2455341.997858	11 56 54.9	4 43 ( 60)	12 09 (69)	19 35 (300)
2010-05-26	2455342.997930	11 57 01.1	4 43 ( 60)	12 09 (69)	19 36 (300)
2010-05-27	2455343.998008	11 57 07.9	4 42 ( 60)	12 09 (69)	19 37 (300)
2010-05-28	2455344.998091	11 57 15.0	4 41 ( 60)	12 09 (69)	19 38 (300)
2010-05-29	2455345.998179	11 57 22.7	4 41 ( 59)	12 09 (70)	19 39 (301)
2010-05-30	2455346.998272	11 57 30.7	4 40 ( 59)	12 10 (70)	19 39 (301)
2010-05-31	2455347.998371	11 57 39.3	4 40 ( 59)	12 10 (70)	19 40 (301)
2010-06- 1	2455348.998474	11 57 48.2	4 39 ( 59)	12 10 (70)	19 41 (301)
2010-06- 2	2455349.998583	11 57 57.5	4 39 ( 59)	12 10 (70)	19 42 (301)
2010-06- 3	2455350.998695	11 58 07.3	4 38 ( 58)	12 10 (70)	19 42 (302)
2010-06- 4	2455351.998812	11 58 17.4	4 38 ( 58)	12 10 (70)	19 43 (302)
2010-06- 5	2455352.998934	11 58 27.9	4 37 ( 58)	12 10 (71)	19 44 (302)
2010-06- 6	2455353.999059	11 58 38.7	4 37 ( 58)	12 11 (71)	19 44 (302)

Date	TDT JD	TDT Time	Rise	(Azm)	Trans	(Alt)	Set	(Azm)
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2010-06- 7	2455354.999188	11 58 49.8	4 37	( 58)	12 11	(71)	19 45	(302)
2010-06- 8	2455355.999320	11 59 01.3	4 37	( 58)	12 11	(71)	19 46	(302)
2010-06- 9	2455356.999456	11 59 13.0	4 36	( 58)	12 11	(71)	19 46	(303)
2010-06-10	2455357.999595	11 59 25.0	4 36	( 57)	12 11	(71)	19 47	(303)
2010-06-11	2455358.999736	11 59 37.2	4 36	( 57)	12 12	(71)	19 47	(303)
2010-06-12	2455359.999880	11 59 49.6	4 36	( 57)	12 12	(71)	19 48	(303)
2010-06-13	2455361.000025	12 00 02.2	4 36	( 57)	12 12	(71)	19 48	(303)
2010-06-14	2455362.000173	12 00 14.9	4 36	( 57)	12 12	(71)	19 49	(303)
2010-06-15	2455363.000322	12 00 27.8	4 36	( 57)	12 12	(71)	19 49	(303)
2010-06-16	2455364.000472	12 00 40.7	4 36	( 57)	12 13	(71)	19 50	(303)
2010-06-17	2455365.000622	12 00 53.8	4 36	( 57)	12 13	(71)	19 50	(303)
2010-06-18	2455366.000773	12 01 06.8	4 36	( 57)	12 13	(71)	19 50	(303)
2010-06-19	2455367.000925	12 01 19.9	4 36	( 57)	12 13	(71)	19 51	(303)
2010-06-20	2455368.001076	12 01 33.0	4 36	( 57)	12 14	(71)	19 51	(303)
2010-06-21	2455369.001227	12 01 46.0	4 36	( 57)	12 14	(71)	19 51	(303)
2010-06-22	2455370.001377	12 01 59.0	4 37	( 57)	12 14	(71)	19 51	(303)
2010-06-23	2455371.001527	12 02 11.9	4 37	( 57)	12 14	(71)	19 51	(303)
2010-06-24	2455372.001675	12 02 24.7	4 37	( 57)	12 14	(71)	19 52	(303)
2010-06-25	2455373.001822	12 02 37.5	4 38	( 57)	12 15	(71)	19 52	(303)
2010-06-26	2455374.001968	12 02 50.0	4 38	( 57)	12 15	(71)	19 52	(303)
2010-06-27	2455375.002112	12 03 02.5	4 38	( 57)	12 15	(71)	19 52	(303)
2010-06-28	2455376.002254	12 03 14.7	4 39	( 57)	12 15	(71)	19 52	(303)
2010-06-29	2455377.002394	12 03 26.8	4 39	( 57)	12 15	(71)	19 52	(303)
2010-06-30	2455378.002531	12 03 38.7	4 40	( 57)	12 16	(71)	19 52	(303)
2010-07- 1	2455379.002666	12 03 50.3	4 40	( 57)	12 16	(71)	19 51	(303)
2010-07- 2	2455380.002798	12 04 01.7	4 41	( 57)	12 16	(71)	19 51	(303)
2010-07- 3	2455381.002927	12 04 12.9	4 41	( 57)	12 16	(71)	19 51	(302)
2010-07- 4	2455382.003052	12 04 23.7	4 42	( 58)	12 16	(71)	19 51	(302)
2010-07- 5	2455383.003174	12 04 34.2	4 42	( 58)	12 17	(71)	19 51	(302)
2010-07- 6	2455384.003292	12 04 44.5	4 43	( 58)	12 17	(71)	19 50	(302)
2010-07- 7	2455385.003407	12 04 54.3	4 44	( 58)	12 17	(71)	19 50	(302)
2010-07- 8	2455386.003517	12 05 03.8	4 44	( 58)	12 17	(70)	19 50	(302)
2010-07- 9	2455387.003622	12 05 13.0	4 45	( 58)	12 17	(70)	19 49	(302)
2010-07-10	2455388.003723	12 05 21.7	4 46	( 58)	12 17	(70)	19 49	(301)
2010-07-11	2455389.003819	12 05 30.0	4 46	( 59)	12 17	(70)	19 48	(301)
2010-07-12	2455390.003910	12 05 37.8	4 47	( 59)	12 18	(70)	19 48	(301)
2010-07-13	2455391.003995	12 05 45.2	4 48	( 59)	12 18	(70)	19 47	(301)
2010-07-14	2455392.004075	12 05 52.1	4 49	( 59)	12 18	(70)	19 47	(301)
2010-07-15	2455393.004149	12 05 58.5	4 49	( 60)	12 18	(69)	19 46	(300)
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2010-07-17	2455395.004278	12 06 09.6	4 51	( 60)	12 18	(69)	19 45	(300)
2010-07-18	2455396.004333	12 06 14.4	4 52	( 60)	12 18	(69)	19 44	(300)
2010-07-19	2455397.004382	12 06 18.6	4 53	( 60)	12 18	(69)	19 43	(299)
2010-07-20	2455398.004424	12 06 22.2	4 54	( 61)	12 18	(69)	19 42	(299)
2010-07-21	2455399.004459	12 06 25.3	4 55	( 61)	12 18	(68)	19 42	(299)
2010-07-22	2455400.004488	12 06 27.8	4 56	( 61)	12 18	(68)	19 41	(299)
2010-07-23	2455401.004510	12 06 29.6	4 56	( 62)	12 18	(68)	19 40	(298)
2010-07-24	2455402.004525	12 06 30.9	4 57	( 62)	12 19	(68)	19 39	(298)
2010-07-25	2455403.004533	12 06 31.6	4 58	( 62)	12 19	(68)	19 38	(298)
2010-07-26	2455404.004534	12 06 31.7	4 59	( 63)	12 19	(67)	19 37	(297)
2010-07-27	2455405.004528	12 06 31.2	5 00	( 63)	12 19	(67)	19 36	(297)
2010-07-28	2455406.004516	12 06 30.2	5 01	( 63)	12 19	(67)	19 35	(297)
2010-07-29	2455407.004496	12 06 28.5	5 02	( 63)	12 18	(67)	19 34	(296)
2010-07-30	2455408.004470	12 06 26.2	5 03	( 64)	12 18	(66)	19 33	(296)
2010-07-31	2455409.004437	12 06 23.3	5 04	( 64)	12 18	(66)	19 32	(296)
2010-08- 1	2455410.004397	12 06 19.9	5 05	( 65)	12 18	(66)	19 31	(295)
2010-08- 2	2455411.004350	12 06 15.8	5 06	( 65)	12 18	(66)	19 30	(295)
2010-08- 3	2455412.004296	12 06 11.2	5 07	( 65)	12 18	(65)	19 29	(295)
2010-08- 4	2455413.004235	12 06 05.9	5 08	( 66)	12 18	(65)	19 27	(294)
2010-08- 5	2455414.004168	12 06 00.1	5 09	( 66)	12 18	(65)	19 26	(294)
2010-08- 6	2455415.004094	12 05 53.7	5 10	( 66)	12 18	(65)	19 25	(293)
2010-08- 7	2455416.004013	12 05 46.7	5 11	( 67)	12 18	(64)	19 24	(293)
2010-08- 8	2455417.003926	12 05 39.2	5 12	( 67)	12 18	(64)	19 22	(293)
2010-08- 9	2455418.003832	12 05 31.1	5 13	( 68)	12 18	(64)	19 21	(292)
2010-08-10	2455419.003731	12 05 22.3	5 14	( 68)	12 17	(64)	19 20	(292)
2010-08-11	2455420.003623	12 05 13.1	5 15	( 68)	12 17	(63)	19 18	(291)
2010-08-12	2455421.003509	12 05 03.2	5 16	( 69)	12 17	(63)	19 17	(291)
2010-08-13	2455422.003389	12 04 52.8	5 18	( 69)	12 17	(63)	19 16	(291)
2010-08-14	2455423.003261	12 04 41.8	5 19	( 70)	12 17	(62)	19 14	(290)
2010-08-15	2455424.003128	12 04 30.2	5 20	( 70)	12 17	(62)	19 13	(290)
2010-08-16	2455425.002988	12 04 18.1	5 21	( 71)	12 16	(62)	19 11	(289)
2010-08-17	2455426.002842	12 04 05.5	5 22	( 71)	12 16	(61)	19 10	(289)
2010-08-18	2455427.002689	12 03 52.4	5 23	( 71)	12 16	(61)	19 08	(288)
2010-08-19	2455428.002531	12 03 38.7	5 24	( 72)	12 16	(61)	19 07	(288)
2010-08-20	2455429.002367	12 03 24.5	5 25	( 72)	12 15	(60)	19 05	(287)
2010-08-21	2455430.002197	12 03 09.9	5 26	( 73)	12 15	(60)	19 04	(287)
2010-08-22	2455431.002022	12 02 54.7	5 27	( 73)	12 15	(60)	19 02	(287)
2010-08-23	2455432.001842	12 02 39.1	5 28	( 74)	12 15	(59)	19 01	(286)
2010-08-24	2455433.001656	12 02 23.1	5 29	( 74)	12 14	(59)	18 59	(286)
2010-08-25	2455434.001466	12 02 06.7	5 30	( 75)	12 14	(59)	18 57	(285)
2010-08-26	2455435.001271	12 01 49.8	5 31	( 75)	12 14	(58)	18 56	(285)
2010-08-27	2455436.001072	12 01 32.6	5 32	( 76)	12 14	(58)	18 54	(284)
2010-08-28	2455437.000868	12 01 15.0	5 33	( 76)	12 13	(58)	18 53	(284)

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		h m s	h m °	h m °	h m °
2010-08-29	2455438.000660	12 00 57.0	5 34 ( 77)	12 13 (57)	18 51 (283)
2010-08-30	2455439.000448	12 00 38.7	5 35 ( 77)	12 13 (57)	18 49 (283)
2010-08-31	2455440.000233	12 00 20.1	5 36 ( 78)	12 12 (57)	18 48 (282)
2010-09- 1	2455441.000014	12 00 01.2	5 37 ( 78)	12 12 (56)	18 46 (282)
2010-09- 2	2455441.999793	11 59 42.1	5 38 ( 78)	12 12 (56)	18 44 (281)
2010-09- 3	2455442.999568	11 59 22.6	5 39 ( 79)	12 11 (55)	18 43 (281)
2010-09- 4	2455443.999340	11 59 03.0	5 40 ( 79)	12 11 (55)	18 41 (280)
2010-09- 5	2455444.999109	11 58 43.1	5 41 ( 80)	12 11 (55)	18 39 (280)
2010-09- 6	2455445.998877	11 58 23.0	5 42 ( 81)	12 10 (54)	18 38 (279)
2010-09- 7	2455446.998642	11 58 02.6	5 44 ( 81)	12 10 (54)	18 36 (279)
2010-09- 8	2455447.998405	11 57 42.2	5 45 ( 82)	12 10 (54)	18 34 (278)
2010-09- 9	2455448.998165	11 57 21.5	5 46 ( 82)	12 09 (53)	18 32 (278)
2010-09-10	2455449.997924	11 57 00.7	5 47 ( 83)	12 09 (53)	18 31 (277)
2010-09-11	2455450.997682	11 56 39.7	5 48 ( 83)	12 09 (53)	18 29 (277)
2010-09-12	2455451.997438	11 56 18.6	5 49 ( 84)	12 08 (52)	18 27 (276)
2010-09-13	2455452.997192	11 55 57.4	5 50 ( 84)	12 08 (52)	18 25 (276)
2010-09-14	2455453.996946	11 55 36.1	5 51 ( 85)	12 08 (51)	18 24 (275)
2010-09-15	2455454.996699	11 55 14.8	5 52 ( 85)	12 07 (51)	18 22 (275)
2010-09-16	2455455.996451	11 54 53.4	5 53 ( 86)	12 07 (51)	18 20 (274)
2010-09-17	2455456.996203	11 54 31.9	5 54 ( 86)	12 07 (50)	18 18 (274)
2010-09-18	2455457.995955	11 54 10.5	5 55 ( 87)	12 06 (50)	18 17 (273)
2010-09-19	2455458.995707	11 53 49.1	5 56 ( 87)	12 06 (49)	18 15 (273)
2010-09-20	2455459.995459	11 53 27.7	5 57 ( 88)	12 05 (49)	18 13 (272)
2010-09-21	2455460.995212	11 53 06.3	5 58 ( 88)	12 05 (49)	18 11 (271)
2010-09-22	2455461.994966	11 52 45.1	5 59 ( 89)	12 05 (48)	18 10 (271)
2010-09-23	2455462.994721	11 52 23.9	6 00 ( 89)	12 04 (48)	18 08 (270)
2010-09-24	2455463.994478	11 52 02.9	6 01 ( 90)	12 04 (47)	18 06 (270)
2010-09-25	2455464.994236	11 51 42.0	6 02 ( 90)	12 04 (47)	18 04 (269)
2010-09-26	2455465.993996	11 51 21.3	6 03 ( 91)	12 03 (47)	18 03 (269)
2010-09-27	2455466.993759	11 51 00.8	6 04 ( 91)	12 03 (46)	18 01 (268)
2010-09-28	2455467.993524	11 50 40.5	6 05 ( 92)	12 03 (46)	17 59 (268)
2010-09-29	2455468.993292	11 50 20.4	6 06 ( 92)	12 02 (46)	17 58 (267)
2010-09-30	2455469.993063	11 50 00.6	6 08 ( 93)	12 02 (45)	17 56 (267)
2010-10- 1	2455470.992837	11 49 41.1	6 09 ( 93)	12 02 (45)	17 54 (266)
2010-10- 2	2455471.992615	11 49 22.0	6 10 ( 94)	12 01 (44)	17 52 (266)
2010-10- 3	2455472.992397	11 49 03.1	6 11 ( 95)	12 01 (44)	17 51 (265)
2010-10- 4	2455473.992183	11 48 44.6	6 12 ( 95)	12 01 (44)	17 49 (265)
2010-10- 5	2455474.991973	11 48 26.5	6 13 ( 96)	12 00 (43)	17 47 (264)
2010-10- 6	2455475.991768	11 48 08.7	6 14 ( 96)	12 00 (43)	17 46 (264)
2010-10- 7	2455476.991567	11 47 51.4	6 15 ( 97)	12 00 (42)	17 44 (263)
2010-10- 8	2455477.991371	11 47 34.4	6 16 ( 97)	12 00 (42)	17 42 (263)
2010-10- 9	2455478.991179	11 47 17.9	6 17 ( 98)	11 59 (42)	17 41 (262)
2010-10-10	2455479.990993	11 47 01.8	6 19 ( 98)	11 59 (41)	17 39 (262)
2010-10-11	2455480.990813	11 46 46.2	6 20 ( 99)	11 59 (41)	17 37 (261)
2010-10-12	2455481.990638	11 46 31.1	6 21 ( 99)	11 59 (41)	17 36 (261)
2010-10-13	2455482.990468	11 46 16.4	6 22 (100)	11 58 (40)	17 34 (260)
2010-10-14	2455483.990304	11 46 02.3	6 23 (100)	11 58 (40)	17 32 (260)
2010-10-15	2455484.990147	11 45 48.7	6 24 (101)	11 58 (39)	17 31 (259)
2010-10-16	2455485.989995	11 45 35.6	6 25 (101)	11 58 (39)	17 29 (259)
2010-10-17	2455486.989851	11 45 23.1	6 26 (102)	11 57 (39)	17 28 (258)
2010-10-18	2455487.989713	11 45 11.2	6 28 (102)	11 57 (38)	17 26 (258)
2010-10-19	2455488.989581	11 44 59.8	6 29 (103)	11 57 (38)	17 25 (257)
2010-10-20	2455489.989457	11 44 49.1	6 30 (103)	11 57 (38)	17 23 (257)
2010-10-21	2455490.989341	11 44 39.0	6 31 (104)	11 57 (37)	17 22 (256)
2010-10-22	2455491.989232	11 44 29.6	6 32 (104)	11 56 (37)	17 20 (256)
2010-10-23	2455492.989130	11 44 20.9	6 33 (105)	11 56 (37)	17 19 (255)
2010-10-24	2455493.989037	11 44 12.8	6 35 (105)	11 56 (36)	17 17 (255)
2010-10-25	2455494.988952	11 44 05.5	6 36 (106)	11 56 (36)	17 16 (254)
2010-10-26	2455495.988875	11 43 58.8	6 37 (106)	11 56 (36)	17 14 (254)
2010-10-27	2455496.988807	11 43 52.9	6 38 (106)	11 56 (35)	17 13 (253)
2010-10-28	2455497.988748	11 43 47.8	6 39 (107)	11 56 (35)	17 12 (253)
2010-10-29	2455498.988698	11 43 43.5	6 41 (107)	11 56 (35)	17 10 (252)
2010-10-30	2455499.988657	11 43 39.9	6 42 (108)	11 56 (34)	17 09 (252)
2010-10-31	2455500.988625	11 43 37.2	6 43 (108)	11 56 (34)	17 08 (251)
2010-11- 1	2455501.988602	11 43 35.2	6 44 (109)	11 56 (34)	17 06 (251)
2010-11- 2	2455502.988589	11 43 34.1	6 46 (109)	11 56 (33)	17 05 (251)
2010-11- 3	2455503.988586	11 43 33.8	6 47 (110)	11 56 (33)	17 04 (250)
2010-11- 4	2455504.988592	11 43 34.3	6 48 (110)	11 56 (33)	17 03 (250)
2010-11- 5	2455505.988608	11 43 35.7	6 49 (110)	11 56 (32)	17 01 (249)
2010-11- 6	2455506.988633	11 43 37.9	6 50 (111)	11 56 (32)	17 00 (249)
2010-11- 7	2455507.988668	11 43 40.9	6 52 (111)	11 56 (32)	16 59 (249)
2010-11- 8	2455508.988713	11 43 44.8	6 53 (112)	11 56 (31)	16 58 (248)
2010-11- 9	2455509.988767	11 43 49.5	6 54 (112)	11 56 (31)	16 57 (248)
2010-11-10	2455510.988831	11 43 55.0	6 55 (113)	11 56 (31)	16 56 (247)
2010-11-11	2455511.988905	11 44 01.4	6 57 (113)	11 56 (31)	16 55 (247)
2010-11-12	2455512.988988	11 44 08.6	6 58 (113)	11 56 (30)	16 54 (247)
2010-11-13	2455513.989081	11 44 16.6	6 59 (114)	11 56 (30)	16 53 (246)
2010-11-14	2455514.989184	11 44 25.5	7 00 (114)	11 56 (30)	16 52 (246)
2010-11-15	2455515.989296	11 44 35.2	7 02 (114)	11 57 (30)	16 51 (245)
2010-11-16	2455516.989418	11 44 45.7	7 03 (115)	11 57 (29)	16 50 (245)
2010-11-17	2455517.989549	11 44 57.0	7 04 (115)	11 57 (29)	16 49 (245)
2010-11-18	2455518.989690	11 45 09.2	7 05 (115)	11 57 (29)	16 49 (244)
2010-11-19	2455519.989840	11 45 22.2	7 06 (116)	11 57 (29)	16 48 (244)



Date	TDT JD	TDT Time			Rise (Azm)			Trans (Alt)			Set (Azm)		
		h	m	s	h	m	°	h	m	°	h	m	°
2010-11-20	2455520.989999	11	45	36.0	7	08	(116)	11	58	(28)	16	47	(244)
2010-11-21	2455521.990168	11	45	50.5	7	09	(116)	11	58	(28)	16	46	(243)
2010-11-22	2455522.990347	11	46	05.9	7	10	(117)	11	58	(28)	16	46	(243)
2010-11-23	2455523.990534	11	46	22.1	7	11	(117)	11	58	(28)	16	45	(243)
2010-11-24	2455524.990730	11	46	39.1	7	12	(117)	11	59	(27)	16	45	(243)
2010-11-25	2455525.990936	11	46	56.9	7	13	(118)	11	59	(27)	16	44	(242)
2010-11-26	2455526.991150	11	47	15.4	7	15	(118)	11	59	(27)	16	44	(242)
2010-11-27	2455527.991373	11	47	34.6	7	16	(118)	12	00	(27)	16	43	(242)
2010-11-28	2455528.991605	11	47	54.7	7	17	(118)	12	00	(27)	16	43	(242)
2010-11-29	2455529.991845	11	48	15.4	7	18	(119)	12	00	(27)	16	42	(241)
2010-11-30	2455530.992093	11	48	36.9	7	19	(119)	12	01	(26)	16	42	(241)
2010-12- 1	2455531.992350	11	48	59.0	7	20	(119)	12	01	(26)	16	42	(241)
2010-12- 2	2455532.992613	11	49	21.8	7	21	(119)	12	01	(26)	16	41	(241)
2010-12- 3	2455533.992885	11	49	45.2	7	22	(120)	12	02	(26)	16	41	(240)
2010-12- 4	2455534.993163	11	50	09.3	7	23	(120)	12	02	(26)	16	41	(240)
2010-12- 5	2455535.993448	11	50	33.9	7	24	(120)	12	03	(26)	16	41	(240)
2010-12- 6	2455536.993740	11	50	59.1	7	25	(120)	12	03	(26)	16	41	(240)
2010-12- 7	2455537.994037	11	51	24.8	7	26	(120)	12	03	(25)	16	40	(240)
2010-12- 8	2455538.994340	11	51	51.0	7	27	(120)	12	04	(25)	16	40	(240)
2010-12- 9	2455539.994649	11	52	17.6	7	28	(121)	12	04	(25)	16	40	(239)
2010-12-10	2455540.994962	11	52	44.7	7	29	(121)	12	05	(25)	16	40	(239)
2010-12-11	2455541.995280	11	53	12.2	7	30	(121)	12	05	(25)	16	41	(239)
2010-12-12	2455542.995602	11	53	40.0	7	30	(121)	12	06	(25)	16	41	(239)
2010-12-13	2455543.995928	11	54	08.2	7	31	(121)	12	06	(25)	16	41	(239)
2010-12-14	2455544.996258	11	54	36.7	7	32	(121)	12	07	(25)	16	41	(239)
2010-12-15	2455545.996590	11	55	05.4	7	33	(121)	12	07	(25)	16	41	(239)
2010-12-16	2455546.996925	11	55	34.3	7	33	(121)	12	08	(25)	16	42	(239)
2010-12-17	2455547.997263	11	56	03.5	7	34	(121)	12	08	(25)	16	42	(239)
2010-12-18	2455548.997603	11	56	32.9	7	35	(121)	12	09	(25)	16	42	(239)
2010-12-19	2455549.997944	11	57	02.4	7	35	(121)	12	09	(25)	16	43	(239)
2010-12-20	2455550.998287	11	57	32.0	7	36	(121)	12	10	(25)	16	43	(239)
2010-12-21	2455551.998630	11	58	01.6	7	37	(121)	12	10	(25)	16	43	(239)
2010-12-22	2455552.998974	11	58	31.4	7	37	(121)	12	11	(25)	16	44	(239)
2010-12-23	2455553.999319	11	59	01.1	7	37	(121)	12	11	(25)	16	45	(239)
2010-12-24	2455554.999663	11	59	30.9	7	38	(121)	12	11	(25)	16	45	(239)
2010-12-25	2455556.000007	12	00	00.6	7	38	(121)	12	12	(25)	16	46	(239)
2010-12-26	2455557.000350	12	00	30.3	7	39	(121)	12	12	(25)	16	46	(239)
2010-12-27	2455558.000692	12	00	59.8	7	39	(121)	12	13	(25)	16	47	(239)
2010-12-28	2455559.001033	12	01	29.3	7	39	(121)	12	13	(25)	16	48	(239)
2010-12-29	2455560.001372	12	01	58.5	7	40	(121)	12	14	(25)	16	48	(239)
2010-12-30	2455561.001708	12	02	27.6	7	40	(121)	12	14	(25)	16	49	(239)
2010-12-31	2455562.002042	12	02	56.4	7	40	(121)	12	15	(25)	16	50	(239)

for Greenwich Meridian = per il meridiano di Greenwich  
for Rome : per Roma  
Longitude = longitudine  
Latitude = latitudine  
Time Zone = fuso orario  
UT = tempo universale  
Ephemeris Transit = transito  
Date = data nel formato anno/mese/giorno  
JD = giorno giuliano  
Time = ora  
Rise, trans, set = orari di levata, altezza in gradi durante il transito a sud e tramonto.  
Azm = azimut in ° calcolato da nord

Per località differenti da quella calcolata (42°N, 12°E) fare riferimento alla tabella correttiva posta in fondo all'almanacco.

Tempi in T.U.+1, aggiungere un'ora quando si adotta l'ora legale

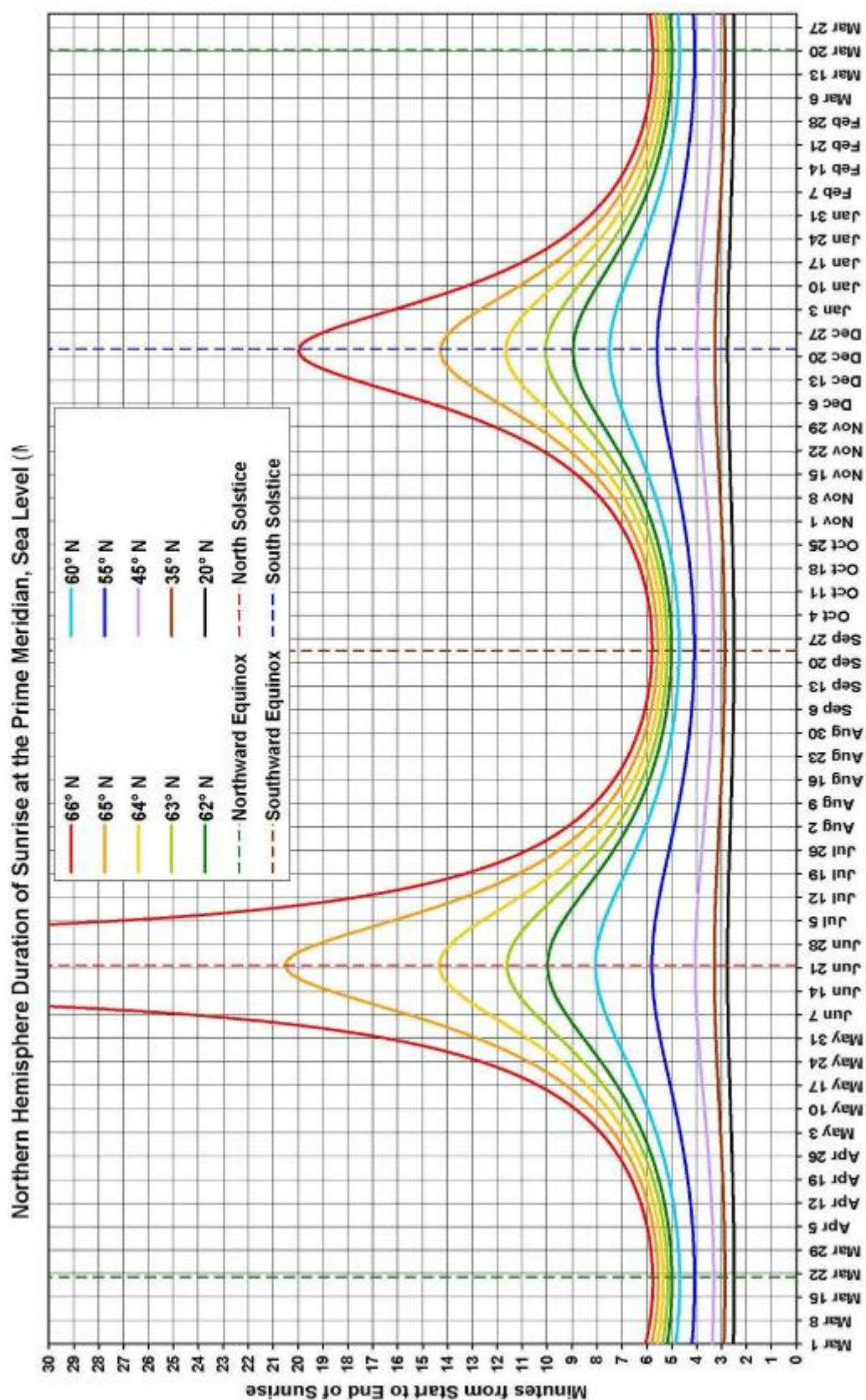
Date = date in the format yyyy/mm/dd  
Rise, transits, set = times of rising, transit and setting, altitude in ° during the south transit.  
Azm = azimuth in ° from north

For different places (42°N, 12°E) to refer to the corrective table in the last pages of the almanac.

Times in local time, to add an hour when it is in use daylight saving time

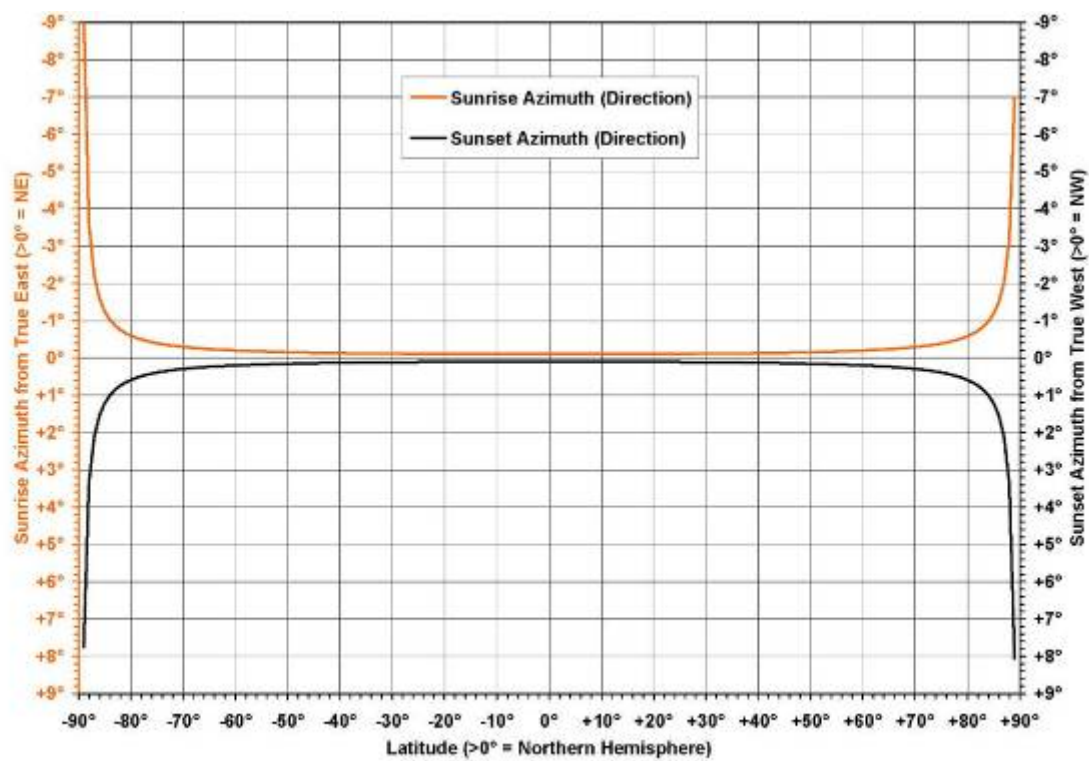
# DURATA DELLA LEVATA E DEL TRAMONTO

## DURATION OF THE SUNRISE AND OF THE SUNSET



Il grafico mostra quanti minuti impiega il Sole per sorgere o tramontare alle varie latitudini

The graph shows how many minutes needs the Sun to rise or to set at the various latitudes

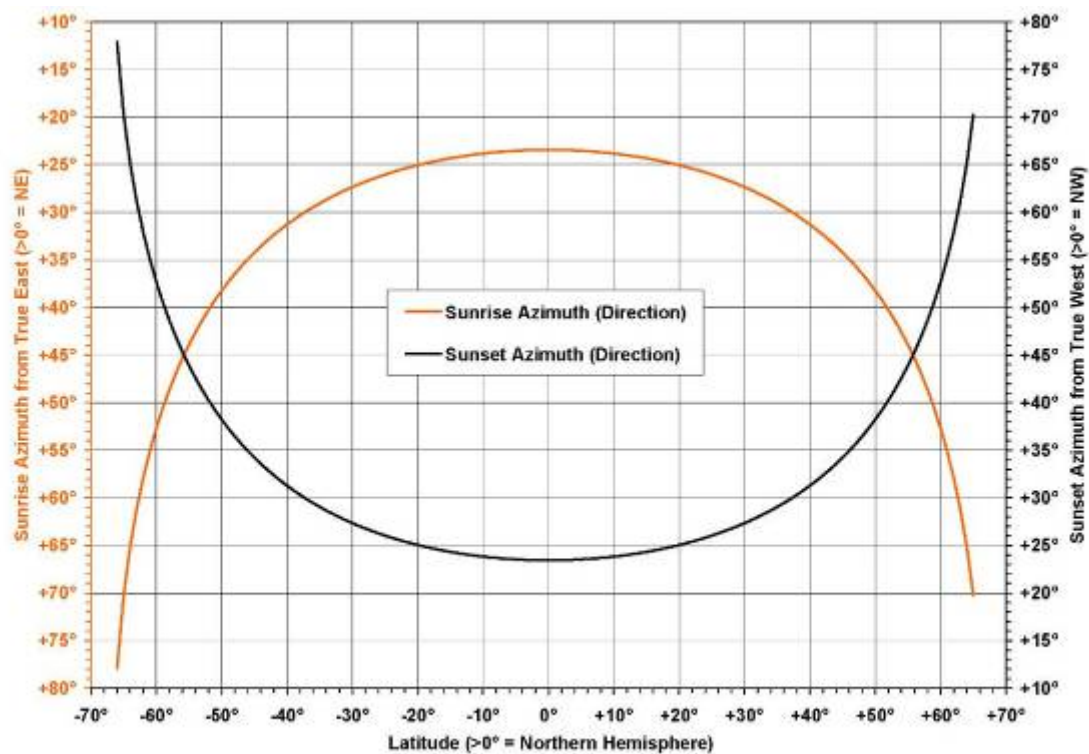


Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.syn454.org/seasons/>

Posizione dell'azimut del Sole all'alba ed al tramonto, all'equinozio di primavera, alle varie latitudini, rispetto all'est ed all'ovest veri

Position of the azimuth of the Sun at the rising and setting, at the spring equinox, at the various latitudes, in comparison to the true east and to the true west

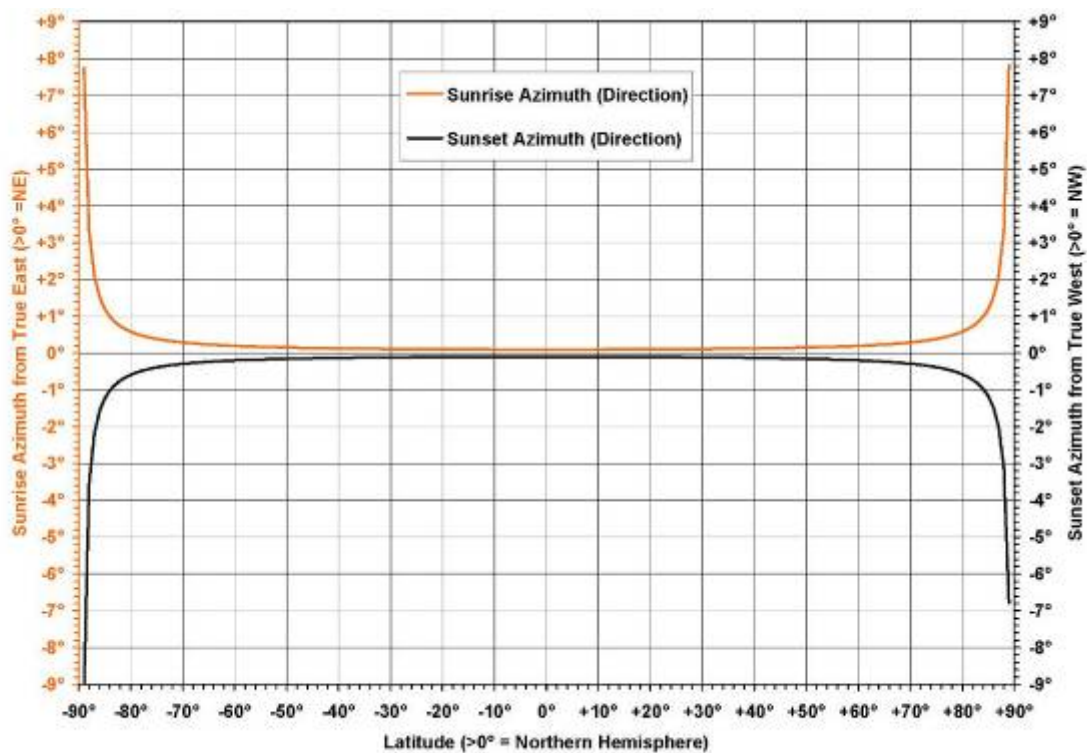


Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.syn454.org/seasons/>

Posizione dell'azimut del Sole all'alba ed al tramonto, al solstizio d'estate, alle varie latitudini, rispetto all'est ed all'ovest veri

Position of the azimuth of the Sun at the rising and setting, at the summer solstice, at the various latitudes, in comparison to the true east and to the true west

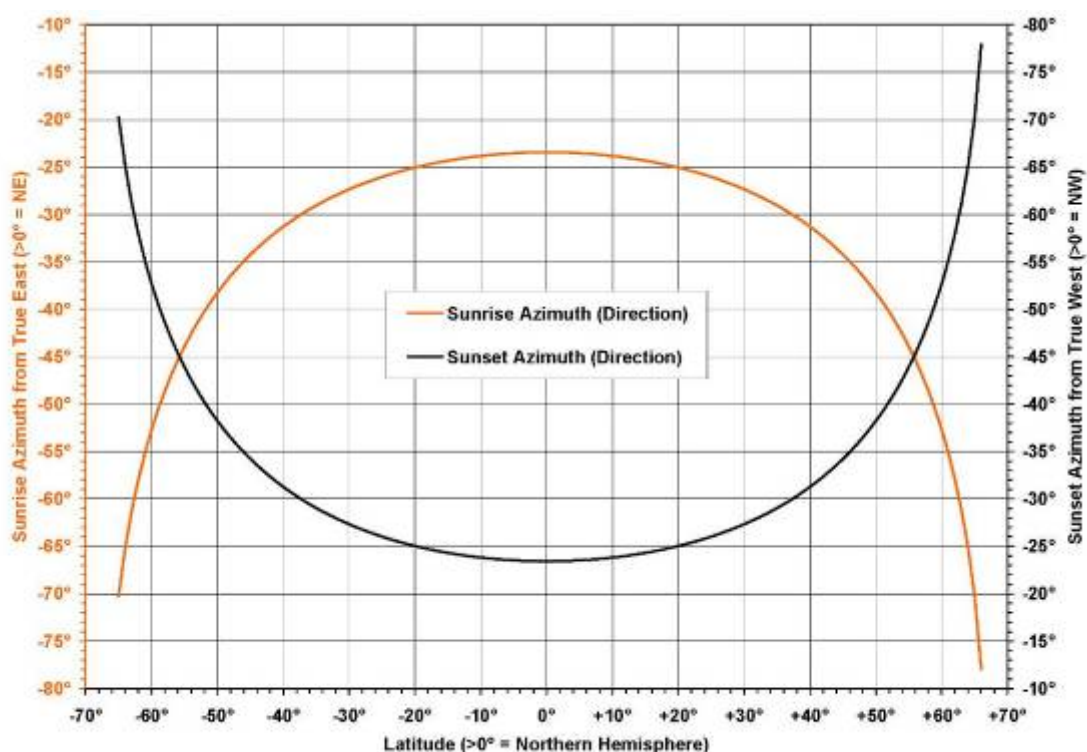


Analysis by Dr. Irv Brumberg, University of Toronto, Canada

<http://www.symbols4u.org/seasons/>

Posizione dell'azimut del Sole all'alba ed al tramonto, all'equinozio d'autunno, alle varie latitudini, rispetto all'est ed all'ovest veri

Position of the azimuth of the Sun at the rising and setting, at the autumn equinox, at the various latitudes, in comparison to the true east and to the true west



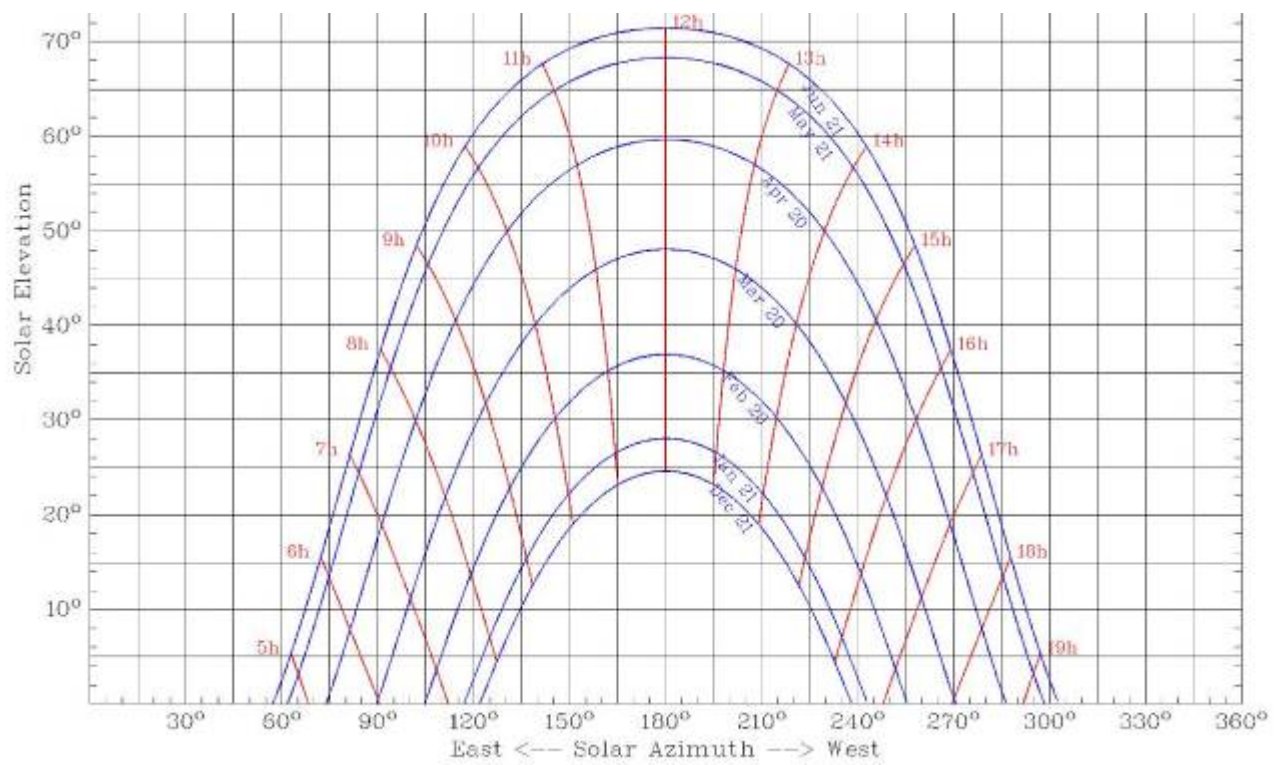
Analysis by Dr. Irv Brumberg, University of Toronto, Canada

<http://www.symbols4u.org/seasons/>

Posizione dell'azimut del Sole all'alba ed al tramonto, al solstizio d'inverno, alle varie latitudini, rispetto all'est ed all'ovest veri

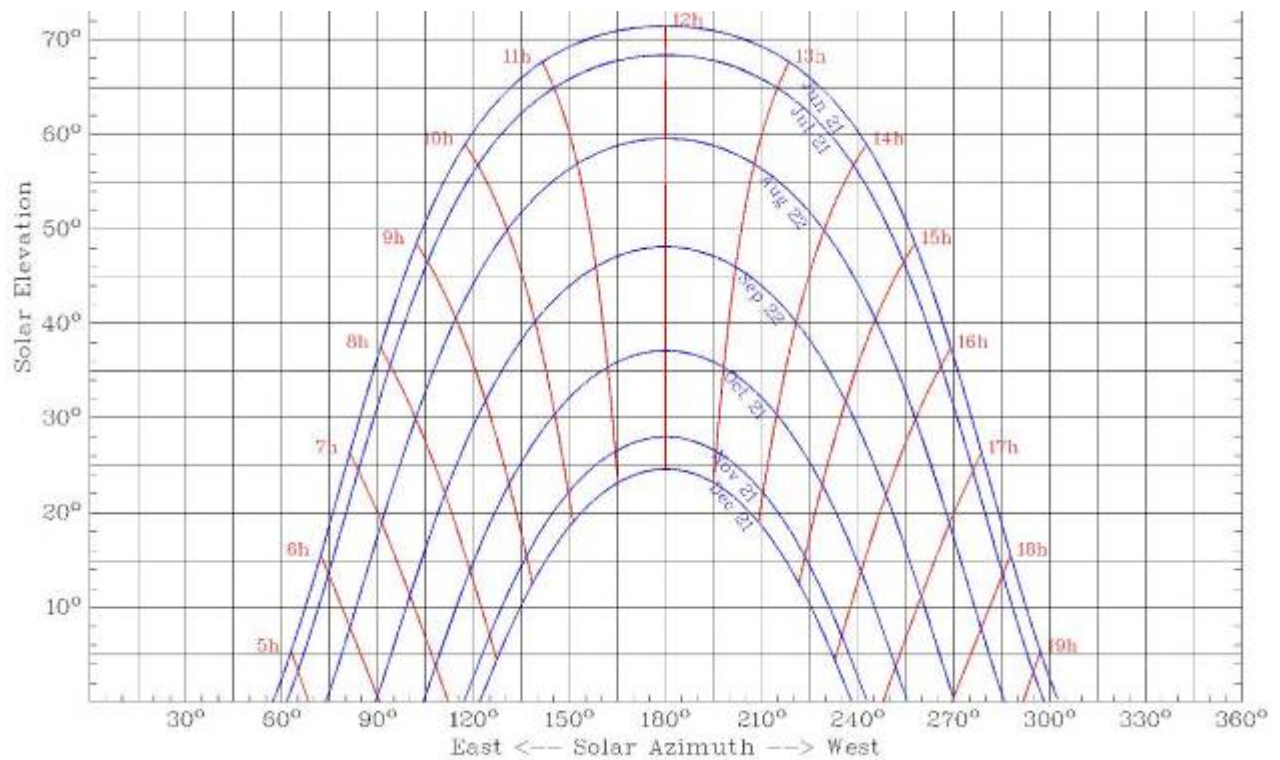
Position of the azimuth of the Sun at the rising and setting, at the winter solstice, at the various latitudes, in comparison to the true east and to the true west





Altezza sull'orizzonte ed azimut del Sole per ogni mese ed ora, periodo gennaio-giugno  
Calcolato per Roma

Altitude and azimuth of the Sun above the horizon for each month and hour, january-june  
For Rome



Altezza sull'orizzonte ed azimut del Sole per ogni mese ed ora, periodo luglio-dicembre  
Calcolato per Roma

Altitude and azimuth of the Sun above the horizon for each month and hour, july-december  
For Rome

# CREPUSCOLI - TWILIGHTS

Longitude:E 12 00.0 Latitude:N 42 00.0 (Rome) Time Zone: UT+1

Date	Civil		Nautical		Astronomical	
	Morning	Evening	Morning	Evening	Morning	Evening
	h m	h m	h m	h m	h m	h m
2010-01- 1	7 08	17 23	6 33	17 58	5 59	18 32
2010-01- 2	7 09	17 24	6 34	17 59	6 00	18 32
2010-01- 3	7 09	17 24	6 34	17 59	6 00	18 33
2010-01- 4	7 09	17 25	6 34	18 00	6 00	18 34
2010-01- 5	7 09	17 26	6 34	18 01	6 00	18 35
2010-01- 6	7 09	17 27	6 34	18 02	6 00	18 36
2010-01- 7	7 09	17 28	6 34	18 03	6 00	18 37
2010-01- 8	7 09	17 29	6 34	18 04	6 00	18 38
2010-01- 9	7 08	17 30	6 34	18 05	6 00	18 38
2010-01-10	7 08	17 31	6 33	18 06	6 00	18 39
2010-01-11	7 08	17 32	6 33	18 07	6 00	18 40
2010-01-12	7 08	17 33	6 33	18 08	6 00	18 41
2010-01-13	7 07	17 34	6 33	18 09	5 59	18 42
2010-01-14	7 07	17 35	6 33	18 10	5 59	18 43
2010-01-15	7 07	17 36	6 32	18 11	5 59	18 44
2010-01-16	7 06	17 37	6 32	18 12	5 59	18 45
2010-01-17	7 06	17 38	6 32	18 13	5 58	18 46
2010-01-18	7 06	17 40	6 31	18 14	5 58	18 47
2010-01-19	7 05	17 41	6 31	18 15	5 57	18 48
2010-01-20	7 04	17 42	6 30	18 16	5 57	18 49
2010-01-21	7 04	17 43	6 30	18 17	5 57	18 50
2010-01-22	7 03	17 44	6 29	18 18	5 56	18 51
2010-01-23	7 03	17 45	6 29	18 19	5 56	18 53
2010-01-24	7 02	17 47	6 28	18 20	5 55	18 54
2010-01-25	7 01	17 48	6 27	18 22	5 54	18 55
2010-01-26	7 01	17 49	6 27	18 23	5 54	18 56
2010-01-27	7 00	17 50	6 26	18 24	5 53	18 57
2010-01-28	6 59	17 51	6 25	18 25	5 52	18 58
2010-01-29	6 58	17 53	6 25	18 26	5 52	18 59
2010-01-30	6 57	17 54	6 24	18 27	5 51	19 00
2010-01-31	6 56	17 55	6 23	18 28	5 50	19 01
2010-02- 1	6 55	17 56	6 22	18 30	5 49	19 02
2010-02- 2	6 54	17 57	6 21	18 31	5 48	19 04
2010-02- 3	6 53	17 59	6 20	18 32	5 48	19 05
2010-02- 4	6 52	18 00	6 19	18 33	5 47	19 06
2010-02- 5	6 51	18 01	6 18	18 34	5 46	19 07
2010-02- 6	6 50	18 02	6 17	18 35	5 45	19 08
2010-02- 7	6 49	18 03	6 16	18 37	5 44	19 09
2010-02- 8	6 48	18 05	6 15	18 38	5 43	19 10
2010-02- 9	6 47	18 06	6 14	18 39	5 42	19 11
2010-02-10	6 46	18 07	6 13	18 40	5 40	19 13
2010-02-11	6 45	18 08	6 12	18 41	5 39	19 14
2010-02-12	6 43	18 10	6 11	18 42	5 38	19 15
2010-02-13	6 42	18 11	6 09	18 44	5 37	19 16
2010-02-14	6 41	18 12	6 08	18 45	5 36	19 17
2010-02-15	6 40	18 13	6 07	18 46	5 35	19 18
2010-02-16	6 38	18 14	6 06	18 47	5 33	19 19
2010-02-17	6 37	18 16	6 04	18 48	5 32	19 21
2010-02-18	6 36	18 17	6 03	18 49	5 31	19 22
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Date	Civil		Nautical		Astronomical	
	Morning	Evening	Morning	Evening	Morning	Evening
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Date	Civil		Nautical		Astronomical	
	Morning	Evening	Morning	Evening	Morning	Evening
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Longitude = longitudine  
 Latitude = latitudine  
 Time Zone = fuso orario  
 Date = data nel formato anno/mese/giorno  
 Civil = civile  
 Nautical = nautico  
 Astronomical = astronomico  
 Morning = mattino  
 Evening = sera  
 Data nel formato aaaa/mm/gg

Tempi in T.U.+1, aggiungere un'ora quando si adotta l'ora legale

Times in local time, to add an hour when it is in use daylight saving time

© (1)

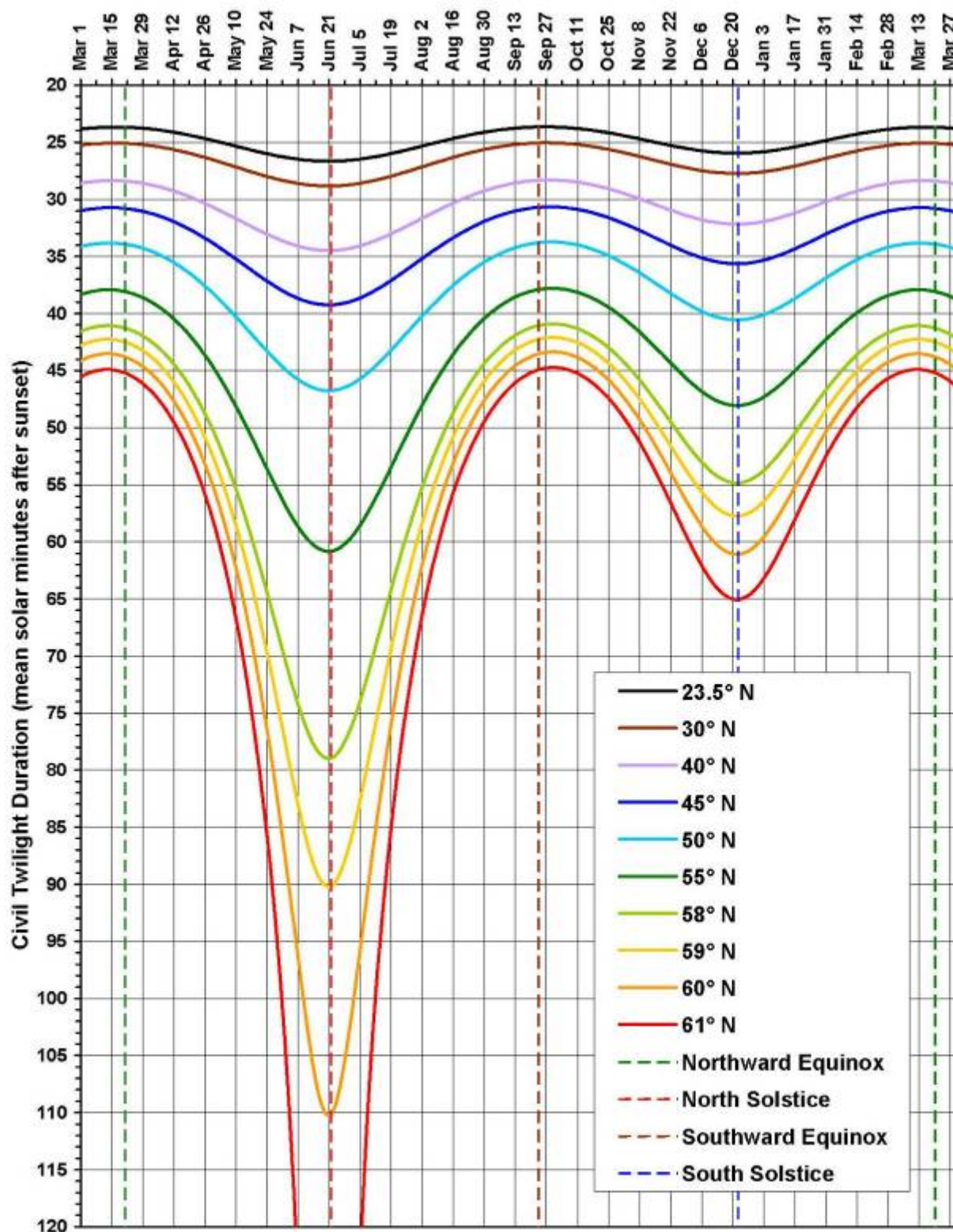
## DURATA DEL GIORNO - DURATION OF THE DAY

### 42°N - 12°E

G	Gen.	Feb	Mar	Apr	Mag	Giu	Lug	Ago	Set	Ott	Nov	Dic
D	Jan.	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m	h m
01	09:11	10:02	11:14	12:42	14:02	15:02	15:11	14:26	13:09	11:45	10:22	09:21
02	09:12	10:04	11:17	12:45	14:05	15:03	15:11	14:24	13:06	11:43	10:20	09:20
03	09:13	10:06	11:20	12:48	14:07	15:04	15:10	14:21	13:03	11:40	10:17	09:19
04	09:14	10:09	11:23	12:50	14:09	15:05	15:09	14:19	13:01	11:37	10:15	09:18
05	09:15	10:11	11:26	12:53	14:12	15:06	15:08	14:17	12:58	11:34	10:12	09:16
06	09:16	10:13	11:28	12:56	14:14	15:07	15:07	14:15	12:55	11:32	10:10	09:15
07	09:17	10:16	11:31	12:59	14:16	15:08	15:06	14:12	12:52	11:29	10:07	09:14
08	09:18	10:18	11:34	13:02	14:19	15:09	15:05	14:10	12:50	11:26	10:05	09:13
09	09:19	10:21	11:37	13:04	14:21	15:10	15:04	14:08	12:47	11:23	10:03	09:13
10	09:20	10:23	11:40	13:07	14:23	15:11	15:03	14:05	12:44	11:20	10:01	09:12
11	09:22	10:26	11:42	13:10	14:25	15:11	15:02	14:03	12:41	11:18	09:58	09:11
12	09:23	10:29	11:45	13:13	14:27	15:12	15:01	14:00	12:39	11:15	09:56	09:10
13	09:25	10:31	11:48	13:15	14:29	15:12	14:59	13:58	12:36	11:12	09:54	09:10
14	09:26	10:34	11:51	13:18	14:32	15:13	14:58	13:56	12:33	11:09	09:52	09:09
15	09:28	10:36	11:54	13:21	14:34	15:13	14:57	13:53	12:30	11:07	09:50	09:08
16	09:29	10:39	11:57	13:23	14:36	15:14	14:55	13:51	12:27	11:04	09:48	09:08
17	09:31	10:42	12:00	13:26	14:38	15:14	14:54	13:48	12:25	11:01	09:45	09:08
18	09:33	10:44	12:02	13:29	14:39	15:14	14:52	13:46	12:22	10:59	09:43	09:07
19	09:35	10:47	12:05	13:31	14:41	15:14	14:50	13:43	12:19	10:56	09:41	09:07
20	09:36	10:50	12:08	13:34	14:43	15:15	14:49	13:40	12:16	10:53	09:40	09:07
21	09:38	10:52	12:11	13:37	14:45	15:15	14:47	13:38	12:13	10:50	09:38	09:07
22	09:40	10:55	12:14	13:39	14:47	15:15	14:45	13:35	12:11	10:48	09:36	09:07
23	09:42	10:58	12:17	13:42	14:48	15:14	14:43	13:33	12:08	10:45	09:34	09:07
24	09:44	11:01	12:19	13:45	14:50	15:14	14:42	13:30	12:05	10:43	09:32	09:07
25	09:46	11:03	12:22	13:47	14:52	15:14	14:40	13:27	12:02	10:40	09:31	09:07
26	09:48	11:06	12:25	13:50	14:53	15:14	14:38	13:25	11:59	10:37	09:29	09:08
27	09:50	11:09	12:28	13:52	14:55	15:13	14:36	13:22	11:57	10:35	09:27	09:08
28	09:53	11:12	12:31	13:55	14:56	15:13	14:34	13:20	11:54	10:32	09:26	09:08
29	09:55		12:34	13:57	14:58	15:12	14:32	13:17	11:51	10:30	09:24	09:09
30	09:57		12:36	14:00	14:59	15:12	14:30	13:14	11:48	10:27	09:23	09:10
31	09:59		12:39		15:01		14:28	13:11		10:24		09:10

# DURATA DEI CREPUSCOLI

## DURATION OF THE TWILIGHTS

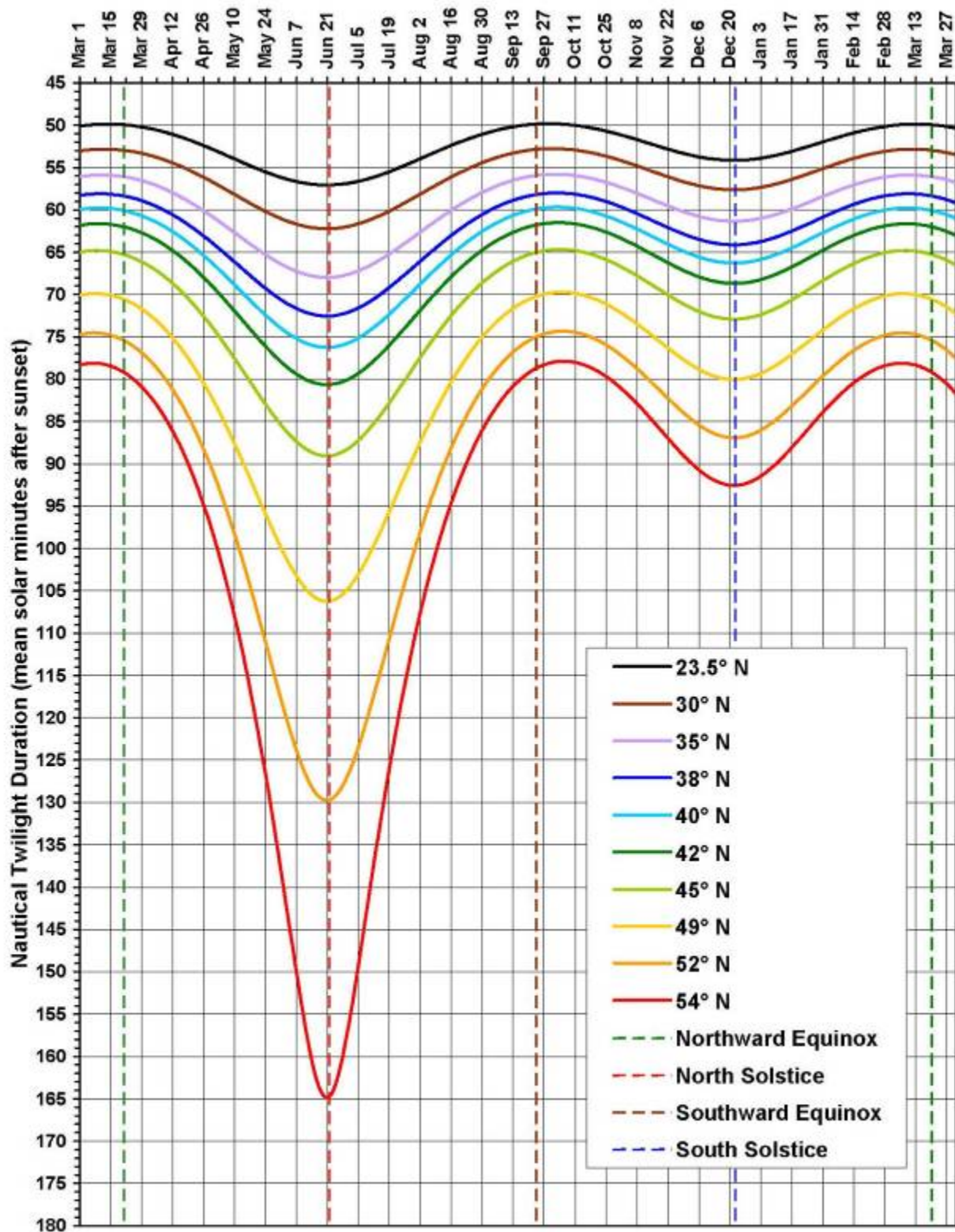


Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.sym454.org/twilight/>

Durata in minuti del crepuscolo civile alle varie latitudini, emisfero nord.  
(I grafici dei crepuscoli per alba e tramonto, o per l'emisfero sud, sono simmetrici o capovolti)

Duration of the civil twilight for every latitude, north hemisphere.  
(The graphics for dawn and sunset, or for south hemisphere, are simmetrical or upside-down)



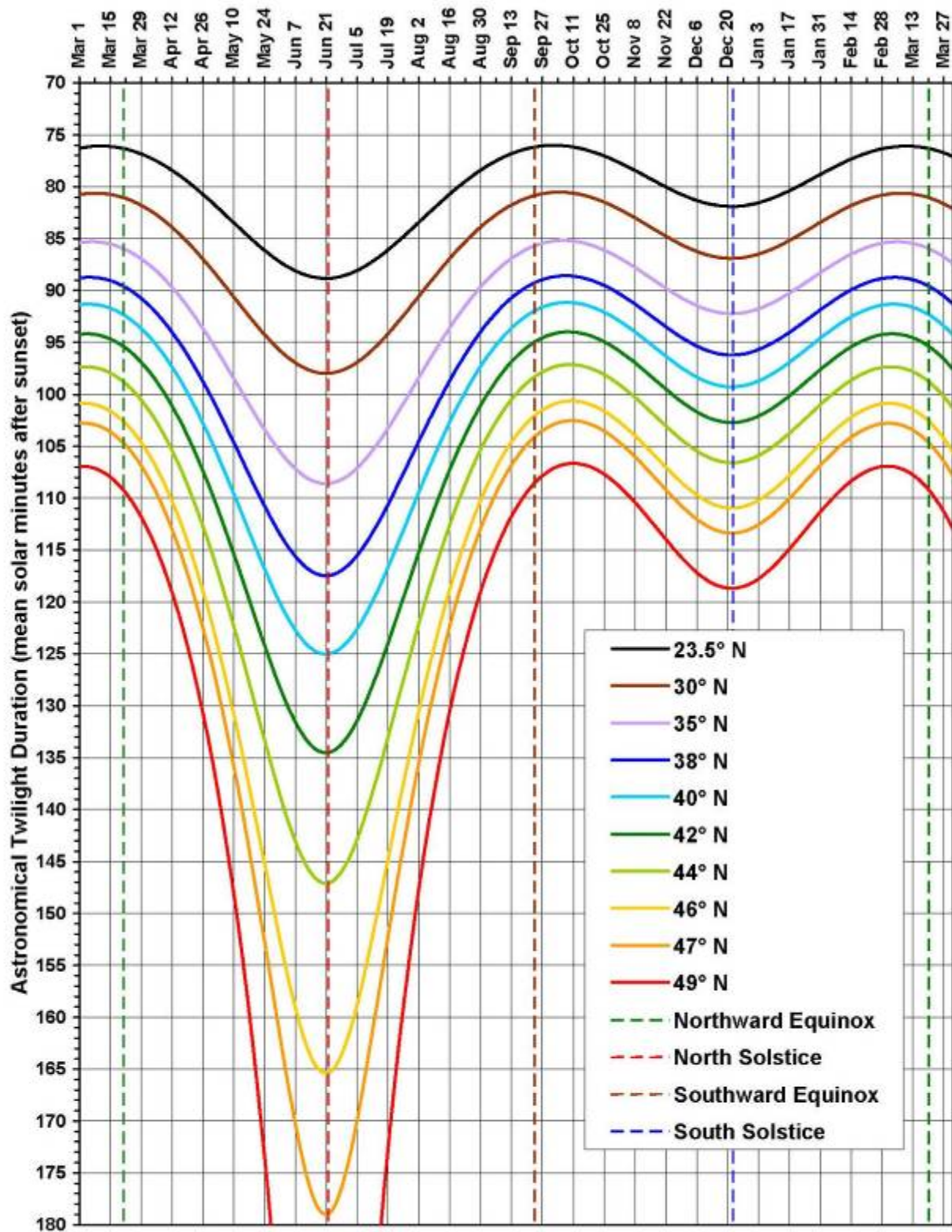
Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.sym454.org/twilight/>

Durata in minuti del crepuscolo nautico alle varie latitudini, emisfero nord.  
(I grafici dei crepuscoli per alba e tramonto, o per l'emisfero sud, sono simmetrici o capovolti)

Duration of the nautical twilight for every latitude, north hemisphere.  
(The graphics for dawn and sunset, of for south hemisphere, are simmetrical or upside-down)



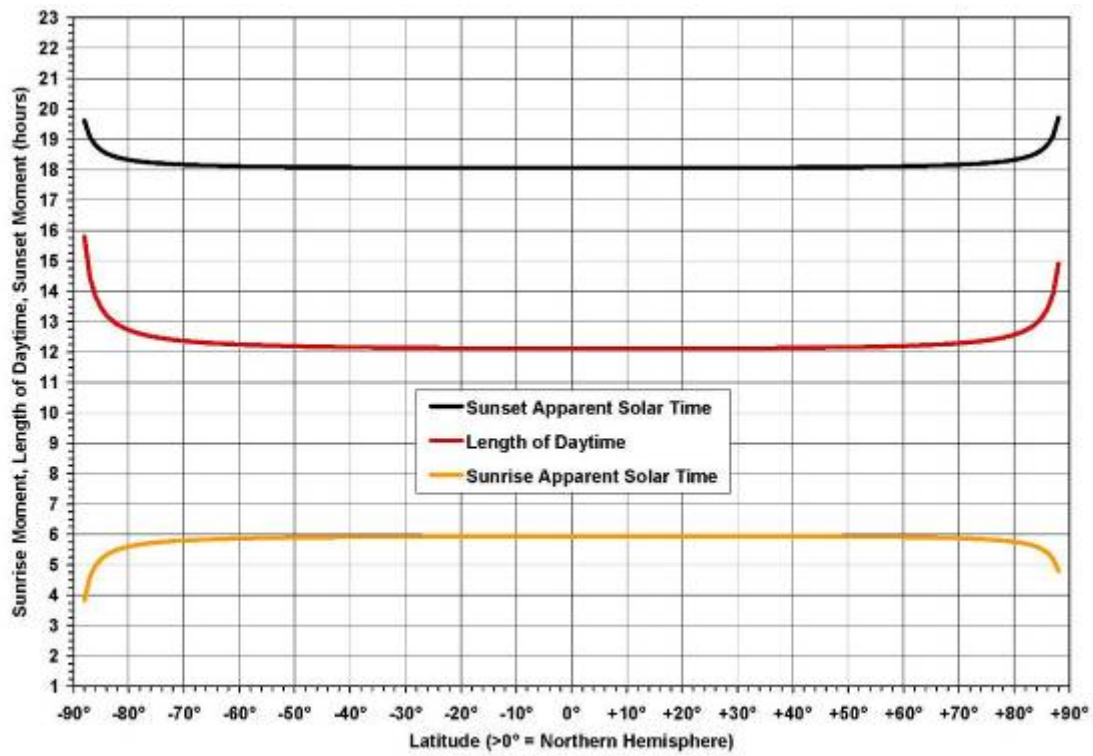


Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.sym454.org/twilight/>

Durata in minuti del crepuscolo astronomico alle varie latitudini, emisfero nord.  
(I grafici dei crepuscoli per alba e tramonto, o per l'emisfero sud, sono simmetrici o capovolti)

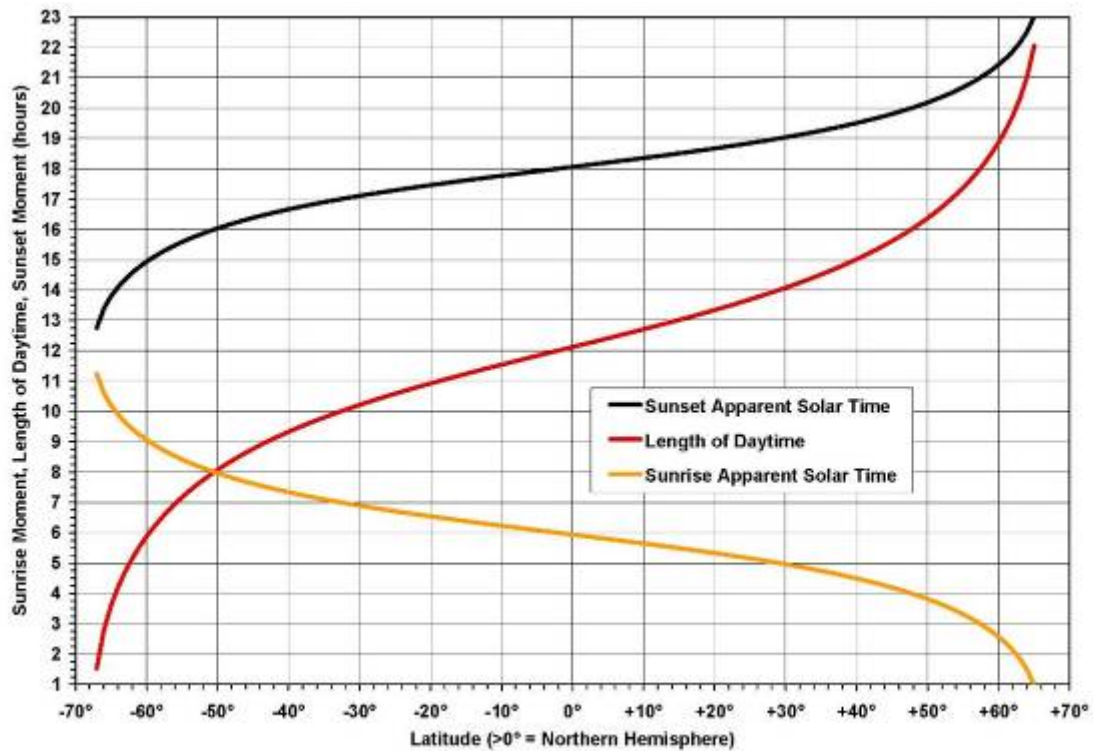
Duration of the astronomical twilight for every latitude, north hemisphere.  
(The graphics for dawn and sunset, of for south hemisphere, are simmetrical or upside-down)



Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.syn454.org/seasons/>

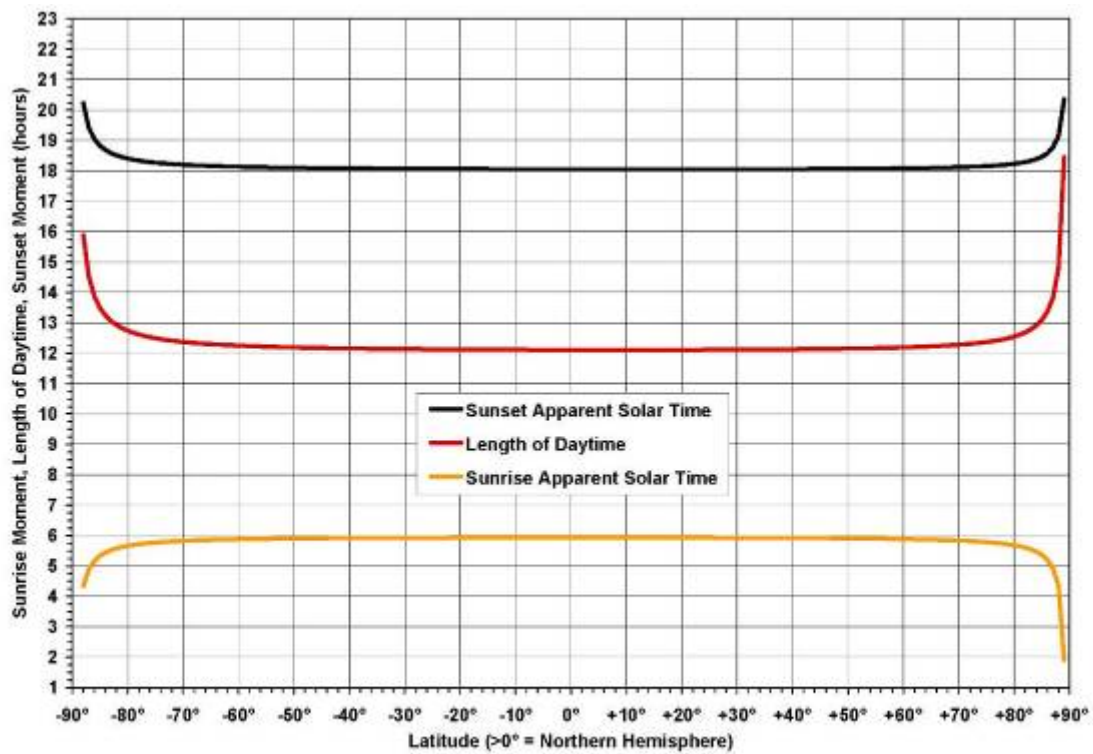
Equinozio di primavera: ora di levata e tramonto del Sole e durata del giorno alle varie latitudini  
 Spring equinox: times of rising and setting of the Sun and duration of the day at various latitudes



Analysis by Dr. Irv Bromberg, University of Toronto, Canada

<http://www.syn454.org/seasons/>

Solstizio d'estate: ora di levata e tramonto del Sole e durata del giorno alle varie latitudini  
 Summer solstice: times of rising and setting of the Sun and duration of the day at various latitudes

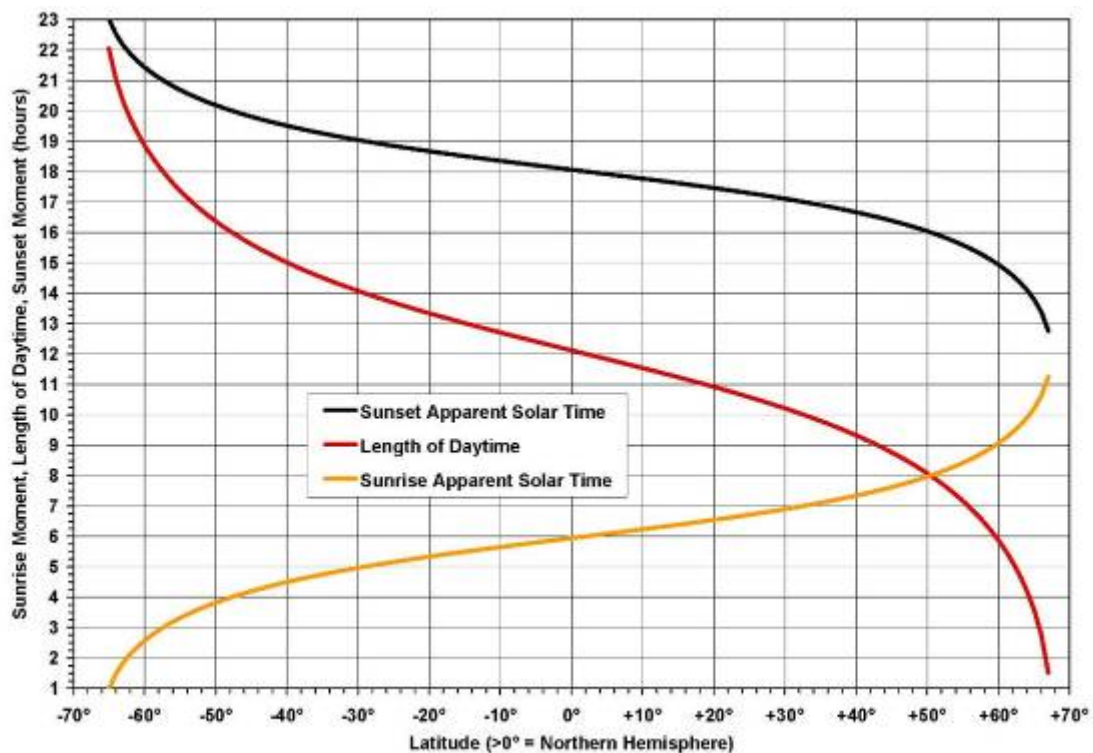


Analysis by Dr. Irv Bramberg, University of Toronto, Canada

<http://www.syn454.org/seasons/>

Equinozio d'autunno: ora di levata e tramonto del Sole e durata del giorno alle varie latitudini

Autumn equinox: times of rising and setting of the Sun and duration of the day at various latitudes



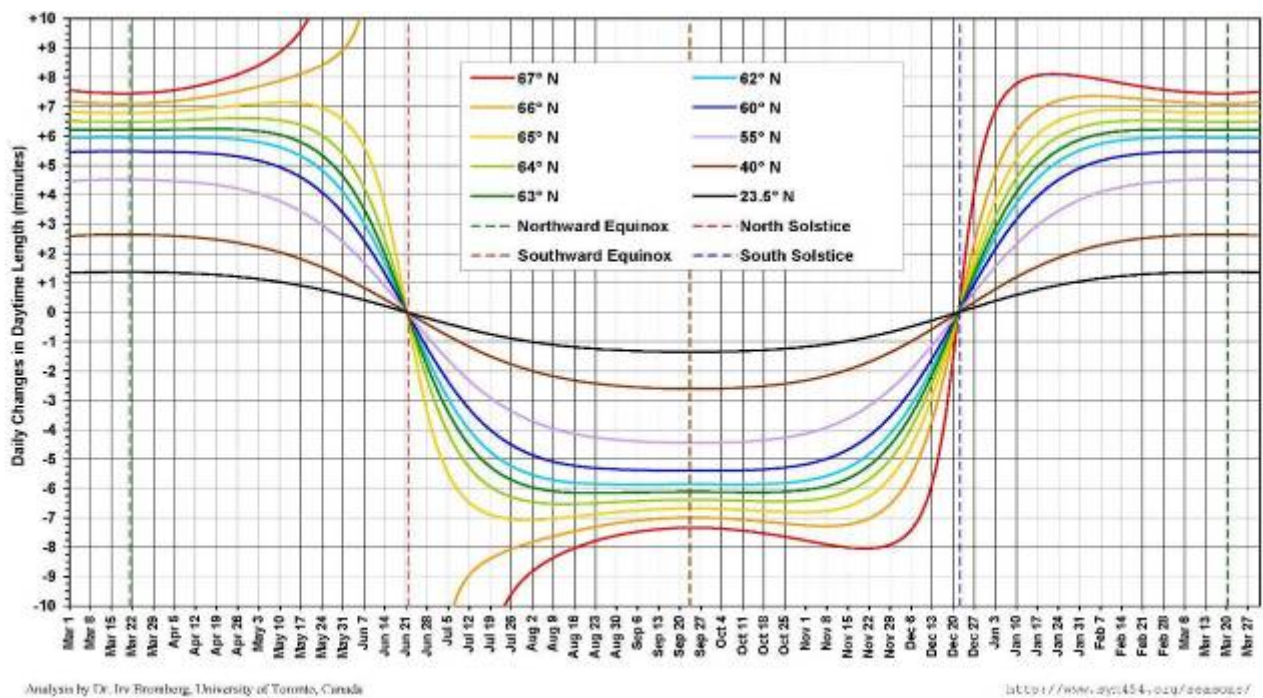
Analysis by Dr. Irv Bramberg, University of Toronto, Canada

<http://www.syn454.org/seasons/>

Solstizio d'inverno: ora di levata e tramonto del Sole e durata del giorno alle varie latitudini

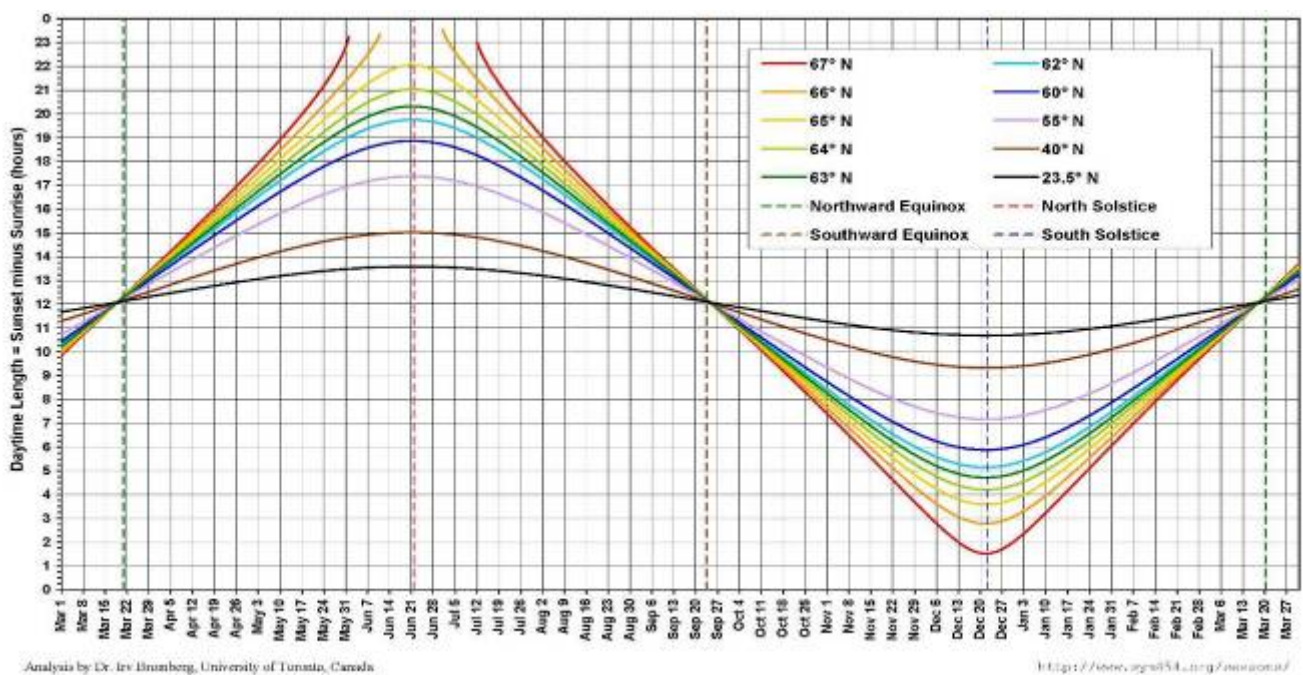
Winter solstice: times of rising and setting of the Sun and duration of the day at various latitudes





Variazione incrementale della durata del giorno nel corso dell'anno alle varie latitudini

Incremental variation of the duration of the day during the year for various latitudes

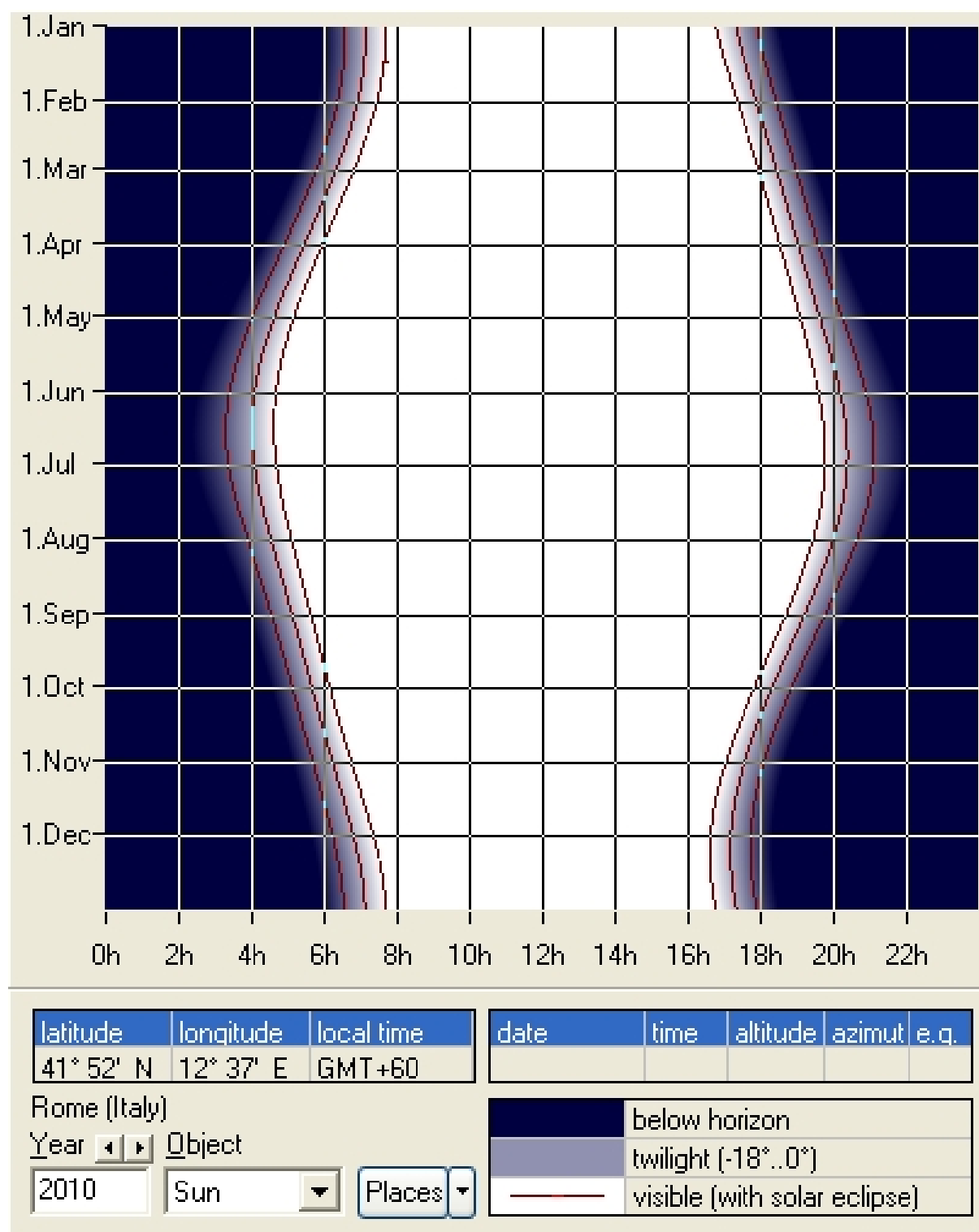


Durata del giorno nel corso dell'anno alle varie latitudini (emisfero nord)

Duration of the day during the year for various latitudes (north hemisphere)



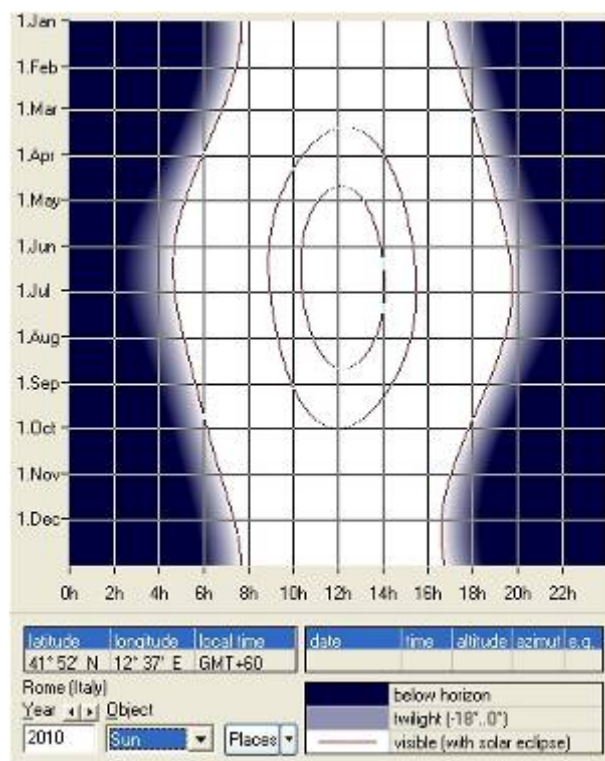
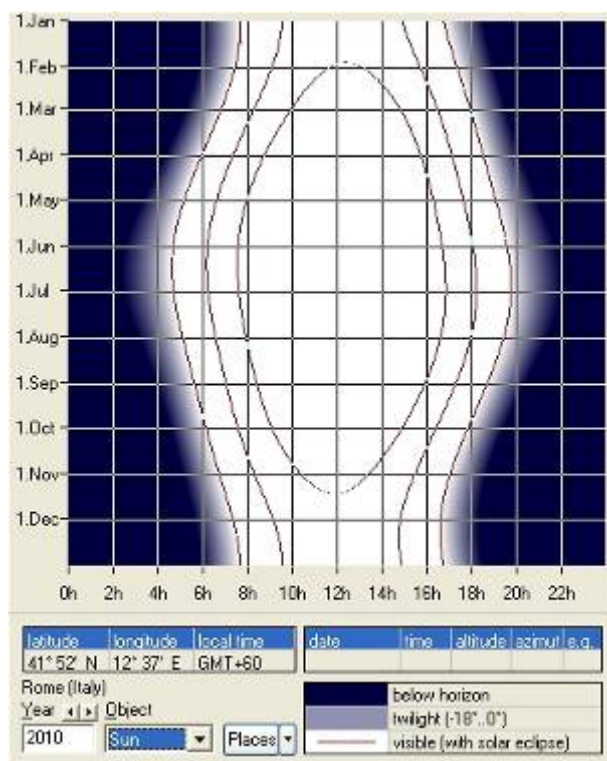
# VISIBILITA' DEL SOLE - VISIBILITY OF THE SUN



Visibilità del Sole nel corso dell'anno  
Visibility of the Sun during the year

Le 2 righe rosse più interne indicano gli istanti in cui il Sole è sull'orizzonte  
Le 2 righe rosse intermedie indicano gli istanti in cui il Sole è a -6° dall'orizzonte, inizia o finisce il crepuscolo civile  
Le 2 righe rosse più esterne indicano gli istanti in cui il Sole è a -12° dall'orizzonte, inizia o finisce il crepuscolo nautico

Inner red lines : sunset or sunrise  
Medium red lines : Sun at -6°, civil twilights  
Exterior red lines: Sun at -12°, nautical twilights



Altezza del Sole sull'orizzonte nel corso dell'anno  
Altitude of the Sun above the horizon during the year

Figura di sinistra:

la linea rossa continua interna indica gli istanti del giorno in cui il Sole supera i 30° sull'orizzonte  
le 2 linee rosse intermedie indicano gli istanti del giorno in cui il Sole supera i 15° sull'orizzonte

Figura di destra:

la linea rossa continua interna indica gli istanti del giorno in cui il Sole supera i 60° sull'orizzonte  
la linea rossa continua intermedia indica gli istanti del giorno in cui il Sole supera i 45° sull'orizzonte

Esempio : il 1° luglio il Sole sorge alle 4.45 circa, alle 6.15 circa si trova a 15° sull'orizzonte, alle 7.30 circa a 30°, alle 9 a 45°, dalle 10.30 alle 14 circa sarà ad oltre 60°, ecc.

Left:

inner red line, the Sun is over 30°  
medium red line, the Sun is over 15°

Right:

inner red line, the Sun is over 60°  
medium red line, the Sun is over 45°

© (3)

# EFFEMERIDI DI MERCURIO - EPHEMERIDES OF MERCURY

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase ang'	Rise	Transit	Set
01/01/2010	19h 21m 17.39s	-20° 28' 24.1"	0.3075809	0.7026857	5.84	8.7	9.6	2.7	0.062	151.1	8.01	12.44	17.28
02/01/2010	19h 16m 30.33s	-20° 18' 34.7"	0.3082229	0.6905666	5.74	6.7	9.7	3.3	0.036	158.1	7.51	12.36	17.20
03/01/2010	19h 11m 12.77s	-20° 10' 14.0"	0.3094958	0.6813310	5.67	4.7	9.9	4	0.018	164.8	7.41	12.26	17.11
04/01/2010	19h 05m 34.46s	-20° 03' 21.6"	0.3113791	0.6751140	5.61	3.1	10.0	4.6	0.007	170.1	7.31	12.17	17.02
05/01/2010	18h 59m 46.26s	-19° 57' 56.8"	0.3138436	0.6719695	5.59	2.8	10.0	4.7	0.006	171.2	7.21	12.07	16.52
06/01/2010	18h 53m 59.37s	-19° 53' 58.7"	0.3168520	0.6718670	5.59	4.1	10.0	4.3	0.012	167.2	7.11	11.57	16.43
07/01/2010	18h 48m 24.51s	-19° 51' 26.5"	0.3203613	0.6746970	5.61	6.0	10.0	3.6	0.027	161.2	7.02	11.48	16.34
08/01/2010	18h 43m 11.25s	-19° 50' 19.3"	0.3243237	0.6802814	5.66	8.1	9.9	3	0.048	154.7	6.53	11.39	16.25
09/01/2010	18h 38m 27.44s	-19° 50' 35.6"	0.3286885	0.6883892	5.72	10.1	9.8	2.5	0.074	148.3	6.44	11.31	16.17
10/01/2010	18h 34m 19.02s	-19° 52' 13.0"	0.3334036	0.6987540	5.81	12.0	9.6	2	0.105	142.1	6.37	11.23	16.09
11/01/2010	18h 30m 49.93s	-19° 55' 07.3"	0.3384169	0.7110911	5.91	13.8	9.5	1.6	0.140	136.1	6.30	11.16	16.02
12/01/2010	18h 28m 02.30s	-19° 59' 13.1"	0.3436770	0.7251125	6.03	15.4	9.3	1.3	0.176	130.4	6.23	11.09	15.55
13/01/2010	18h 25m 56.75s	-20° 04' 23.3"	0.3491346	0.7405385	6.16	16.9	9.1	1	0.213	125.1	6.18	11.04	15.49
14/01/2010	18h 24m 32.67s	-20° 10' 29.6"	0.3547425	0.7571067	6.30	18.2	8.9	0.8	0.250	120.0	6.13	10.59	15.44
15/01/2010	18h 23m 48.59s	-20° 17' 22.7"	0.3604567	0.7745772	6.44	19.4	8.7	0.6	0.287	115.2	6.09	10.54	15.39
16/01/2010	18h 23m 42.43s	-20° 24' 53.0"	0.3662361	0.7927351	6.59	20.4	8.5	0.5	0.323	110.7	6.06	10.50	15.35
17/01/2010	18h 24m 11.77s	-20° 32' 50.5"	0.3720429	0.8113911	6.75	21.3	8.3	0.3	0.358	106.5	6.03	10.47	15.31
18/01/2010	18h 25m 13.99s	-20° 41' 05.4"	0.3778423	0.8303816	6.91	22.0	8.1	0.2	0.392	102.5	6.01	10.45	15.28
19/01/2010	18h 26m 46.46s	-20° 49' 28.2"	0.3836030	0.8495658	7.06	22.7	7.9	0.2	0.424	98.8	5.99	10.42	15.25
20/01/2010	18h 28m 46.62s	-20° 57' 50.0"	0.3892964	0.8688249	7.22	23.2	7.7	0.1	0.454	95.2	5.98	10.41	15.23
21/01/2010	18h 31m 11.98s	-21° 06' 02.5"	0.3948970	0.8880589	7.38	23.6	7.6	0	0.483	91.9	5.97	10.39	15.21
22/01/2010	18h 34m 00.26s	-21° 13' 58.0"	0.4003816	0.9071847	7.54	24.0	7.4	0	0.510	88.8	5.97	10.38	15.20
23/01/2010	18h 37m 09.31s	-21° 21' 29.5"	0.4057297	0.9261336	7.70	24.3	7.3	0	0.536	85.9	5.96	10.38	15.19
24/01/2010	18h 40m 37.19s	-21° 28' 30.8"	0.4109229	0.9448495	7.86	24.5	7.1	-0.1	0.560	83.1	5.96	10.37	15.18
25/01/2010	18h 44m 22.10s	-21° 34' 56.2"	0.4159449	0.9632869	8.01	24.6	7.0	-0.1	0.582	80.5	5.97	10.37	15.17
26/01/2010	18h 48m 22.44s	-21° 40' 40.5"	0.4207810	0.9814094	8.16	24.7	6.9	-0.1	0.603	78.1	5.97	10.37	15.17
27/01/2010	18h 52m 36.75s	-21° 45' 39.2"	0.4254185	0.9991880	8.31	24.8	6.7	-0.1	0.623	75.7	5.98	10.38	15.17
28/01/2010	18h 57m 03.71s	-21° 49' 48.4"	0.4298459	1.0166001	8.45	24.7	6.6	-0.1	0.642	73.5	5.99	10.38	15.18
29/01/2010	19h 01m 42.15s	-21° 53' 04.3"	0.4340532	1.0336284	8.60	24.7	6.5	-0.1	0.660	71.4	6.00	10.39	15.18
30/01/2010	19h 06m 30.99s	-21° 55' 23.9"	0.4380314	1.0502597	8.73	24.6	6.4	-0.1	0.676	69.3	6.01	10.40	15.19
31/01/2010	19h 11m 29.29s	-21° 56' 44.1"	0.4417727	1.0664843	8.87	24.5	6.3	-0.1	0.692	67.4	6.02	10.41	15.20
01/02/2010	19h 16m 36.17s	-21° 57' 02.6"	0.4452703	1.0822956	9.00	24.3	6.2	-0.1	0.707	65.6	6.03	10.42	15.21
02/02/2010	19h 21m 50.88s	-21° 56' 17.1"	0.4485181	1.0976891	9.13	24.1	6.1	-0.1	0.721	63.8	6.04	10.44	15.23
03/02/2010	19h 27m 12.70s	-21° 54' 25.5"	0.4515108	1.1126622	9.25	23.9	6.0	-0.1	0.734	62.1	6.06	10.45	15.24
04/02/2010	19h 32m 41.02s	-21° 51' 26.1"	0.4542438	1.1272139	9.37	23.6	6.0	-0.1	0.747	60.4	6.07	10.47	15.26
05/02/2010	19h 38m 15.25s	-21° 47' 17.5"	0.4567133	1.1413444	9.49	23.4	5.9	-0.1	0.759	58.9	6.08	10.48	15.28
06/02/2010	19h 43m 54.89s	-21° 41' 58.3"	0.4589157	1.1550548	9.61	23.1	5.8	-0.1	0.770	57.3	6.10	10.50	15.31
07/02/2010	19h 49m 39.47s	-21° 35' 27.3"	0.4608481	1.1683470	9.72	22.7	5.8	-0.1	0.781	55.8	6.11	10.52	15.33
08/02/2010	19h 55m 28.56s	-21° 27' 43.5"	0.4625081	1.1812233	9.82	22.4	5.7	-0.1	0.791	54.4	6.12	10.54	15.35
09/02/2010	20h 01m 21.76s	-21° 18' 45.9"	0.4638936	1.1936864	9.93	22.1	5.6	-0.1	0.801	53.0	6.14	10.56	15.38
10/02/2010	20h 07m 18.75s	-21° 08' 33.7"	0.4650030	1.2057390	10.03	21.7	5.6	-0.2	0.811	51.6	6.15	10.58	15.41
11/02/2010	20h 13m 19.19s	-20° 57' 06.3"	0.4658350	1.2173842	10.12	21.3	5.5	-0.2	0.820	50.3	6.16	11.00	15.44
12/02/2010	20h 19m 22.81s	-20° 44' 23.0"	0.4663886	1.2286244	10.22	20.9	5.5	-0.2	0.828	48.9	6.17	11.02	15.47
13/02/2010	20h 25m 29.35s	-20° 30' 23.3"	0.4666632	1.2394624	10.31	20.4	5.4	-0.2	0.837	47.6	6.18	11.04	15.50
14/02/2010	20h 31m 38.58s	-20° 15' 06.6"	0.4666585	1.2499001	10.39	20.0	5.4	-0.2	0.845	46.4	6.20	11.06	15.54
15/02/2010	20h 37m 50.29s	-19° 58' 32.7"	0.4663745	1.2599394	10.48	19.5	5.3	-0.2	0.853	45.1	6.21	11.09	15.57
16/02/2010	20h 44m 04.29s	-19° 40' 41.1"	0.4658115	1.2695815	10.56	19.1	5.3	-0.3	0.861	43.9	6.22	11.11	16.01
17/02/2010	20h 50m 20.43s	-19° 21' 31.5"	0.4649701	1.2788270	10.63	18.6	5.3	-0.3	0.868	42.6	6.23	11.13	16.05
18/02/2010	20h 56m 38.57s	-19° 01' 03.6"	0.4638514	1.2876759	10.71	18.1	5.2	-0.3	0.875	41.4	6.24	11.16	16.09
19/02/2010	21h 02m 58.58s	-18° 39' 17.3"	0.4624566	1.2961272	10.78	17.5	5.2	-0.3	0.882	40.1	6.24	11.18	16.13
20/02/2010	21h 09m 20.35s	-18° 16' 12.3"	0.4607874	1.3041794	10.85	17.0	5.2	-0.3	0.889	38.9	6.25	11.21	16.17
21/02/2010	21h 15m 43.79s	-17° 51' 48.5"	0.4588458	1.3118297	10.91	16.5	5.1	-0.4	0.896	37.6	6.26	11.23	16.21
22/02/2010	21h 22m 08.84s	-17° 26' 05.8"	0.4566343	1.3190745	10.97	15.9	5.1	-0.4	0.903	36.4	6.27	11.26	16.25
23/02/2010	21h 28m 35.43s	-16° 59' 04.1"	0.4541559	1.3259089	11.03	15.3	5.1	-0.4	0.909	35.1	6.27	11.28	16.30
24/02/2010	21h 35m 03.51s	-16° 30' 43.3"	0.4514141	1.3323268	11.08	14.7	5.0	-0.5	0.916	33.8	6.28	11.31	16.34
25/02/2010	21h 41m 33.06s	-16° 01' 03.5"	0.4484127	1.3383208	11.13	14.1	5.0	-0.5	0.922	32.5	6.29	11.33	16.39
26/02/2010	21h 48m 04.05s	-15° 30' 04.6"	0.4451564	1.3438818	11.18	13.4	5.0	-0.6	0.928	31.1	6.29	11.36	16.43
27/02/2010	21h 54m 36.48s	-14° 57' 46.6"	0.4416505	1.3489993	11.22	12.8	5.0	-0.6	0.934	29.8	6.30	11.38	16.48
28/02/2010	22h 01m 10.36s	-14° 24' 09.7"	0.4379011	1.3536608	11.26	12.1	5.0	-0.7	0.940	28.4	6.30	11.41	16.53
01/03/2010	22h 07m 45.70s	-13° 49' 13.9"	0.4339150	1.3578519	11.29	11.4	5.0	-0.7	0.946	26.9	6.30	11.44	16.58
02/03/2010	22h 14m 22.54s	-13° 12' 59.4"	0.4297002	1.3615560	11.32	10.7	4.9	-0.8	0.951	25.5	6.31	11.46	17.03
03/03/2010	22h 21m 00.91s	-12° 35' 26.4"	0.4252656	1.3647543	11.35	10.0	4.9	-0.8	0.957	23.9	6.31	11.49	17.08
04/03/2010	22h 27m 40.87s	-11° 56' 35.3"	0.4206212	1.3674258	11.37	9.3	4.9	-0.9	0.962	22.4	6.31	11.52	17.14
05/03/2010	22h 34m 22.45s	-11° 16' 26.4"	0.4157786	1.3695468	11.39	8.5	4.9	-0.9	0.968	20.7	6.31	11.55	17.19
06/03/2010	22h 41m 05.72s	-10° 35' 00.5"	0.4107506	1.3710910	11.40	7.8	4.9	-1	0.973	19.1	6.32	11.57	17.24
07/03/2010	22h 47m 50.73s	-09° 52' 18.1"	0.4055519	1.3720295	11.41	7.0	4.9	-1.1	0.977	17.3	6.32	12.00	17.30
08/03/2010	22h 54m 37.54s	-09° 08' 20.0"	0.4001989	1.3723302	11.41	6.2	4.9	-1.2	0.982	15.5	6.32	12.03	17.36
09/03/2010	23h 01m 26.19s	-08° 23' 07.5"	0.3947101	1.3719586	11.41	5.4	4.9	-1.3	0.986	13.6	6.32	12.06	17.41
10/03/2010	23h 08m 16.74s	-07° 36' 41.8"	0.3891060	1.3708767	11.40	4.6	4.9	-1.4	0.990	11.7	6.32	12.09	17.47
11/03/2010	23h 15m 09.21s	-06° 49' 04.4"	0.3834099	1.3690438	11.39	3.7	4.9	-1.5	0.993	9.7	6.32	12.12	17.53
12/03/2010	23h 22m 03.63s	-06° 00' 17.3"	0.3776475	1.3664161	11.36	2.9	4.9	-1.6	0.995	7.8	6.32	12.15	17.59
13/03/2010	23h 29m 00.01s	-05° 10' 22.7"	0.3718473	1.3629470	11.34	2.2	4.9	-1.7	0.997	5.9	6.32	12.18	18.05
14/03/2010	23h 35m 58.32s	-04° 19' 23.6"	0.3660409	1.3585874	11.30	1.6	5.0	-1.8	0.998	4.5	6.32	12.21	18.11
15/03/2010	23h 42m 58.50s	-03° 27'											

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase ang°	Rise	Transit	Set
09/04/2010	02h 19m 42.65s	+16° 47' 30.4"	0.3385791	0.8775128	7.30	19.4	7.7	0.1	0.401	101.5	6.14	13.20	20.28
10/04/2010	02h 23m 10.95s	+17° 11' 12.5"	0.3438461	0.8524153	7.09	19.3	7.9	0.2	0.365	105.7	6.12	13.20	20.28
11/04/2010	02h 26m 16.71s	+17° 31' 47.0"	0.3493090	0.8279105	6.89	19.1	8.1	0.4	0.330	109.9	6.10	13.19	20.29
12/04/2010	02h 28m 59.37s	+17° 49' 11.6"	0.3549209	0.8040961	6.69	18.9	8.4	0.6	0.297	114.0	6.07	13.17	20.28
13/04/2010	02h 31m 18.53s	+18° 03' 23.9"	0.3606377	0.7810611	6.50	18.5	8.6	0.8	0.265	118.1	6.05	13.16	20.27
14/04/2010	02h 33m 13.91s	+18° 14' 22.4"	0.3664184	0.7588865	6.31	18.0	8.9	1	0.234	122.1	6.02	13.13	20.25
15/04/2010	02h 34m 45.38s	+18° 22' 06.0"	0.3722253	0.7376459	6.14	17.4	9.1	1.2	0.205	126.1	5.59	13.11	20.23
16/04/2010	02h 35m 53.00s	+18° 26' 34.2"	0.3780239	0.7174059	5.97	16.8	9.4	1.5	0.178	130.1	5.56	13.08	20.20
17/04/2010	02h 36m 37.02s	+18° 27' 47.1"	0.3837829	0.6982272	5.81	16.0	9.6	1.7	0.152	134.0	5.52	13.04	20.16
18/04/2010	02h 36m 57.90s	+18° 25' 45.8"	0.3894737	0.6801643	5.66	15.0	9.9	2	0.129	138.0	5.49	13.01	20.12
19/04/2010	02h 36m 56.35s	+18° 20' 32.5"	0.3950709	0.6632666	5.52	14.0	10.1	2.3	0.106	141.9	5.45	12.56	20.07
20/04/2010	02h 36m 33.31s	+18° 12' 11.1"	0.4005515	0.6475781	5.39	12.9	10.4	2.6	0.086	145.8	5.41	12.52	20.02
21/04/2010	02h 35m 50.01s	+18° 00' 46.6"	0.4058949	0.6331374	5.27	11.7	10.6	2.9	0.068	149.8	5.38	12.47	19.56
22/04/2010	02h 34m 47.91s	+17° 46' 26.6"	0.4110829	0.6199777	5.16	10.5	10.8	3.3	0.052	153.7	5.34	12.42	19.50
23/04/2010	02h 33m 28.78s	+17° 29' 20.3"	0.4160992	0.6081265	5.06	9.1	11.1	3.6	0.038	157.6	5.30	12.37	19.43
24/04/2010	02h 31m 54.63s	+17° 09' 39.6"	0.4209293	0.5976052	4.97	7.7	11.2	4	0.026	161.4	5.25	12.31	19.36
25/04/2010	02h 30m 07.67s	+16° 47' 38.9"	0.4255603	0.5884287	4.89	6.2	11.4	4.4	0.016	165.3	5.21	12.25	19.28
26/04/2010	02h 28m 10.33s	+16° 23' 34.8"	0.4299810	0.5806050	4.83	4.6	11.6	4.9	0.009	169.1	5.17	12.19	19.21
27/04/2010	02h 26m 05.18s	+15° 57' 46.3"	0.4341811	0.5741350	4.78	3.1	11.7	5.3	0.004	172.9	5.13	12.13	19.13
28/04/2010	02h 23m 54.88s	+15° 30' 34.5"	0.4381520	0.5690122	4.73	1.6	11.8	5.8	0.001	176.4	5.08	12.07	19.05
29/04/2010	02h 21m 42.09s	+15° 02' 21.8"	0.4418858	0.5652226	4.70	0.9	11.9	5.9	0.000	177.9	5.04	12.01	18.57
30/04/2010	02h 19m 29.48s	+14° 33' 31.8"	0.4453756	0.5627451	4.68	2.2	11.9	5.6	0.002	175.1	5.00	11.55	18.49
01/05/2010	02h 17m 19.59s	+14° 04' 28.5"	0.4486155	0.5615515	4.67	3.8	12.0	5.2	0.005	171.5	4.56	11.49	18.41
02/05/2010	02h 15m 14.83s	+13° 35' 35.6"	0.4516001	0.5616078	4.67	5.4	12.0	4.8	0.011	168.0	4.52	11.43	18.33
03/05/2010	02h 13m 17.42s	+13° 07' 16.0"	0.4543250	0.5628740	4.68	6.9	11.9	4.4	0.018	164.5	4.48	11.37	18.26
04/05/2010	02h 11m 29.33s	+12° 39' 51.5"	0.4567862	0.5653058	4.70	8.5	11.9	4	0.027	161.0	4.44	11.31	18.18
05/05/2010	02h 09m 52.32s	+12° 13' 41.7"	0.4589802	0.5688550	4.73	10.0	11.8	3.7	0.038	157.6	4.40	11.26	18.11
06/05/2010	02h 08m 27.85s	+11° 49' 04.2"	0.4609041	0.5734710	4.77	11.4	11.7	3.4	0.050	154.3	4.36	11.21	18.05
07/05/2010	02h 07m 17.15s	+11° 26' 14.4"	0.4625556	0.5791014	4.82	12.8	11.6	3.1	0.063	151.0	4.32	11.16	17.58
08/05/2010	02h 06m 21.17s	+11° 05' 24.9"	0.4639326	0.5856929	4.87	14.2	11.5	2.9	0.077	147.9	4.29	11.11	17.53
09/05/2010	02h 05m 40.64s	+10° 46' 46.0"	0.4650334	0.5931924	4.93	15.4	11.3	2.6	0.091	144.8	4.25	11.07	17.47
10/05/2010	02h 05m 16.08s	+10° 30' 25.4"	0.4658567	0.6015477	5.00	16.6	11.2	2.4	0.107	141.8	4.22	11.02	17.42
11/05/2010	02h 05m 07.79s	+10° 16' 28.6"	0.4664016	0.6107079	5.08	17.7	11.0	2.2	0.123	138.9	4.19	10.58	17.37
12/05/2010	02h 05m 15.94s	+10° 04' 59.3"	0.4666676	0.6206242	5.16	18.7	10.8	2	0.140	136.1	4.16	10.55	17.33
13/05/2010	02h 05m 40.51s	+09° 55' 59.1"	0.4666542	0.6312499	5.25	19.6	10.7	1.9	0.157	133.4	4.13	10.51	17.29
14/05/2010	02h 06m 21.41s	+09° 49' 28.0"	0.4663615	0.6425410	5.34	20.5	10.5	1.7	0.174	130.7	4.10	10.48	17.26
15/05/2010	02h 07m 18.44s	+09° 45' 24.8"	0.4657899	0.6544563	5.44	21.3	10.3	1.6	0.191	128.1	4.07	10.45	17.23
16/05/2010	02h 08m 31.33s	+09° 43' 47.2"	0.4649399	0.6669573	5.55	22.0	10.1	1.5	0.209	125.6	4.05	10.43	17.20
17/05/2010	02h 09m 59.76s	+09° 44' 31.8"	0.4638126	0.6800084	5.65	22.6	9.9	1.3	0.227	123.2	4.02	10.40	17.18
18/05/2010	02h 11m 43.38s	+09° 47' 34.8"	0.4624093	0.6935765	5.77	23.1	9.7	1.2	0.244	120.8	4.00	10.38	17.17
19/05/2010	02h 13m 41.83s	+09° 52' 51.6"	0.4607316	0.7076312	5.88	23.6	9.5	1.1	0.262	118.4	3.58	10.36	17.15
20/05/2010	02h 15m 54.73s	+10° 00' 17.3"	0.4587816	0.7221446	6.01	24.0	9.3	1	0.280	116.1	3.55	10.35	17.14
21/05/2010	02h 18m 21.72s	+10° 09' 46.8"	0.4565619	0.7370906	6.13	24.4	9.1	0.9	0.298	113.9	3.53	10.33	17.13
22/05/2010	02h 21m 02.45s	+10° 21' 14.6"	0.4540753	0.7524453	6.26	24.6	8.9	0.9	0.315	111.7	3.51	10.32	17.13
23/05/2010	02h 23m 56.61s	+10° 34' 35.2"	0.4513253	0.7681864	6.39	24.9	8.8	0.8	0.333	109.5	3.50	10.31	17.13
24/05/2010	02h 27m 03.88s	+10° 49' 43.1"	0.4483160	0.7842928	6.52	25.0	8.6	0.7	0.351	107.3	3.48	10.30	17.14
25/05/2010	02h 30m 23.99s	+11° 06' 32.6"	0.4450519	0.8007445	6.66	25.1	8.4	0.6	0.369	105.2	3.46	10.30	17.14
26/05/2010	02h 33m 56.72s	+11° 24' 58.1"	0.4415385	0.8175224	6.80	25.1	8.2	0.6	0.387	103.0	3.45	10.30	17.15
27/05/2010	02h 37m 41.84s	+11° 44' 54.1"	0.4377816	0.8346078	6.94	25.1	8.1	0.5	0.405	100.9	3.43	10.29	17.16
28/05/2010	02h 41m 39.20s	+12° 06' 14.8"	0.4337884	0.8519823	7.08	25.0	7.9	0.4	0.424	98.8	3.42	10.29	17.18
29/05/2010	02h 45m 48.64s	+12° 28' 54.7"	0.4295667	0.8696271	7.23	24.9	7.7	0.4	0.442	96.6	3.41	10.30	17.20
30/05/2010	02h 50m 10.09s	+12° 52' 48.2"	0.4251254	0.8875233	7.38	24.7	7.6	0.3	0.461	94.5	3.39	10.30	17.22
31/05/2010	02h 54m 43.47s	+13° 17' 49.7"	0.4204748	0.9056509	7.53	24.5	7.4	0.2	0.480	92.3	3.38	10.31	17.25
01/06/2010	02h 59m 28.75s	+13° 43' 53.5"	0.4156262	0.9239889	7.68	24.2	7.3	0.2	0.499	90.1	3.38	10.32	17.27
02/06/2010	03h 04m 25.96s	+14° 10' 54.0"	0.4105928	0.9425147	7.84	23.9	7.1	0.1	0.518	87.9	3.37	10.33	17.30
03/06/2010	03h 09m 35.12s	+14° 38' 45.3"	0.4053891	0.9612036	7.99	23.5	7.0	0	0.538	85.6	3.36	10.34	17.33
04/06/2010	03h 14m 56.33s	+15° 07' 21.5"	0.4000317	0.9800287	8.15	23.1	6.9	0	0.558	83.3	3.36	10.36	17.37
05/06/2010	03h 20m 29.68s	+15° 36' 36.6"	0.3945390	0.9989600	8.31	22.6	6.7	-0.1	0.579	80.9	3.35	10.37	17.41
06/06/2010	03h 26m 15.30s	+16° 06' 24.3"	0.3889318	1.0179641	8.46	22.1	6.6	-0.2	0.600	78.5	3.35	10.39	17.45
07/06/2010	03h 32m 13.36s	+16° 36' 38.1"	0.3832333	1.0370035	8.62	21.5	6.5	-0.2	0.621	76.0	3.35	10.41	17.49
08/06/2010	03h 38m 24.02s	+17° 07' 11.1"	0.3774693	1.0560365	8.78	20.9	6.4	-0.3	0.643	73.4	3.35	10.44	17.53
09/06/2010	03h 44m 47.46s	+17° 37' 56.2"	0.3716684	1.0750162	8.94	20.2	6.3	-0.4	0.665	70.8	3.36	10.46	17.58
10/06/2010	03h 51m 23.86s	+18° 08' 45.8"	0.3658625	1.0938902	9.10	19.5	6.1	-0.5	0.687	68.0	3.36	10.49	18.03
11/06/2010	03h 58m 13.39s	+18° 39' 31.8"	0.3600862	1.1125999	9.25	18.8	6.0	-0.5	0.710	65.2	3.37	10.52	18.08
12/06/2010	04h 05m 16.20s	+19° 10' 05.6"	0.3543776	1.1310806	9.41	18.0	5.9	-0.6	0.733	62.2	3.38	10.55	18.14
13/06/2010	04h 12m 32.40s	+19° 40' 18.3"	0.3487781	1.1492608	9.56	17.1	5.9	-0.7	0.756	59.1	3.39	10.59	18.20
14/06/2010	04h 20m 02.06s	+20° 10' 00.1"	0.3433319	1.1670624	9.70	16.3	5.8	-0.8	0.780	56.0	3.41	11.02	18.25
15/06/2010	04h 27m 45.16s	+20° 39' 00.9"	0.3380863	1.1844007	9.85	15.4	5.7	-0.9	0.803	52.7	3.42	11.06	18.31
16/06/2010	04h 35m 41.62s	+21° 07' 09.7"	0.3330907	1.2011850	9.99	14.4	5.6	-0.9	0.826	49.3	3.44	11.10	18.38
17/06/2010	04h 43m 51.23s	+21° 34' 15.5"	0.3283967	1.2173191	10.12	13.4	5.5	-1.1	0.849	45.8	3.47	11.15	18.44
18/06/2010	04h 52m 13.67s	+22° 00' 06.4"	0.3240564	1.2327032	10.25	12.4	5.5	-1.1	0.871	42.1	3.49	11.19	18.51
19/06/2010	05h 00m 48.46s	+22° 24' 30.6"	0.3201218	1.2472348	10.37	11.3	5.4	-1.2	0.892	38.4	3.52	11.24	18.57
20/06/2010	05h 09m 34.97s	+22° 47' 16.0"	0.3166434	1.2608117	10.48	10.2	5.3	-1.3	0.912	34.6	3.55	11.29	19.04
21/06/2010	05h 18m 32.39s	+23° 08' 10.8"	0.31366										

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase ang°	Rise	Transit	Set
22/07/2010	09h 36m 36.44s	+15° 17' 48.5"	0.4256994	1.1181921	9.30	22.4	6.0	-0.2	0.710	65.2	6.49	13.49	20.47
23/07/2010	09h 42m 25.77s	+14° 40' 58.8"	0.4301134	1.1041915	9.18	22.9	6.1	-0.1	0.696	66.9	6.53	13.50	20.46
24/07/2010	09h 48m 05.17s	+14° 03' 55.8"	0.4343066	1.0900758	9.07	23.5	6.2	-0.1	0.682	68.6	6.57	13.52	20.46
25/07/2010	09h 53m 34.75s	+13° 26' 43.9"	0.4382703	1.0758601	8.95	24.0	6.3	0	0.668	70.3	7.01	13.53	20.45
26/07/2010	09h 58m 54.62s	+12° 49' 27.8"	0.4419967	1.0615576	8.83	24.4	6.3	0	0.655	72.0	7.05	13.55	20.43
27/07/2010	10h 04m 04.83s	+12° 12' 11.7"	0.4454789	1.0471801	8.71	24.9	6.4	0	0.641	73.6	7.08	13.56	20.42
28/07/2010	10h 09m 05.44s	+11° 35' 00.0"	0.4487110	1.0327383	8.59	25.3	6.5	0.1	0.628	75.2	7.12	13.57	20.41
29/07/2010	10h 13m 56.46s	+10° 57' 56.9"	0.4516877	1.0182419	8.47	25.7	6.6	0.1	0.614	76.8	7.15	13.58	20.39
30/07/2010	10h 18m 37.89s	+10° 21' 06.5"	0.4544045	1.0036997	8.35	26.0	6.7	0.1	0.600	78.4	7.18	13.58	20.37
31/07/2010	10h 23m 09.70s	+09° 44' 33.2"	0.4568575	0.9891204	8.23	26.3	6.8	0.2	0.587	80.0	7.21	13.59	20.36
01/08/2010	10h 27m 31.81s	+09° 08' 21.2"	0.4590433	0.9745120	8.11	26.6	6.9	0.2	0.573	81.6	7.23	13.59	20.34
02/08/2010	10h 31m 44.12s	+08° 32' 34.7"	0.4609589	0.9598826	7.98	26.8	7.0	0.2	0.559	83.3	7.26	13.59	20.32
03/08/2010	10h 35m 46.50s	+07° 57' 18.3"	0.4626020	0.9452405	7.86	27.0	7.1	0.3	0.544	84.9	7.28	13.59	20.30
04/08/2010	10h 39m 38.77s	+07° 22' 36.4"	0.4639705	0.9305942	7.74	27.2	7.2	0.3	0.530	86.6	7.30	13.59	20.27
05/08/2010	10h 43m 20.72s	+06° 48' 33.8"	0.4650629	0.9159528	7.62	27.3	7.3	0.3	0.515	88.2	7.32	13.59	20.25
06/08/2010	10h 46m 52.09s	+06° 15' 15.3"	0.4658777	0.9013263	7.50	27.3	7.5	0.4	0.500	90.0	7.33	13.58	20.22
07/08/2010	10h 50m 12.58s	+05° 42' 46.2"	0.4664141	0.8867257	7.38	27.4	7.6	0.4	0.485	91.7	7.35	13.58	20.20
08/08/2010	10h 53m 21.85s	+05° 11' 11.8"	0.4666715	0.8721631	7.25	27.3	7.7	0.4	0.469	93.5	7.36	13.57	20.17
09/08/2010	10h 56m 19.51s	+04° 40' 37.9"	0.4666497	0.8576526	7.13	27.3	7.8	0.5	0.453	95.3	7.37	13.56	20.14
10/08/2010	10h 59m 05.12s	+04° 11' 10.4"	0.4663485	0.8432100	7.01	27.2	8.0	0.5	0.437	97.2	7.37	13.54	20.11
11/08/2010	11h 01m 38.19s	+03° 42' 56.0"	0.4657684	0.8288534	6.89	27.0	8.1	0.5	0.420	99.2	7.37	13.53	20.08
12/08/2010	11h 03m 58.20s	+03° 16' 01.3"	0.4649100	0.8146037	6.78	26.7	8.3	0.6	0.403	101.2	7.37	13.51	20.04
13/08/2010	11h 06m 04.56s	+02° 50' 33.7"	0.4637743	0.8004848	6.66	26.5	8.4	0.6	0.385	103.3	7.37	13.49	20.01
14/08/2010	11h 07m 56.68s	+02° 26' 41.0"	0.4623627	0.7865242	6.54	26.1	8.5	0.7	0.367	105.5	7.36	13.47	19.57
15/08/2010	11h 09m 33.89s	+02° 04' 31.3"	0.4606768	0.7727533	6.43	25.7	8.7	0.8	0.348	107.7	7.35	13.45	19.53
16/08/2010	11h 10m 55.52s	+01° 44' 13.5"	0.4587187	0.7592078	6.31	25.2	8.9	0.8	0.329	110.0	7.34	13.42	19.49
17/08/2010	11h 12m 00.87s	+01° 25' 56.8"	0.4564909	0.7459282	6.20	24.6	9.0	0.9	0.309	112.5	7.32	13.39	19.45
18/08/2010	11h 12m 49.23s	+01° 09' 50.8"	0.4539964	0.7329604	6.10	24.0	9.2	1	0.289	115.0	7.29	13.36	19.41
19/08/2010	11h 13m 19.93s	+00° 56' 05.6"	0.4512386	0.7203560	5.99	23.3	9.3	1.1	0.268	117.7	7.27	13.32	19.37
20/08/2010	11h 13m 32.30s	+00° 44' 51.5"	0.4482216	0.7081729	5.89	22.5	9.5	1.2	0.247	120.4	7.24	13.28	19.32
21/08/2010	11h 13m 25.75s	+00° 36' 19.1"	0.4449501	0.6964757	5.79	21.6	9.7	1.3	0.225	123.3	7.20	13.24	19.28
22/08/2010	11h 12m 59.80s	+00° 30' 38.5"	0.4414293	0.6853359	5.70	20.6	9.8	1.5	0.204	126.3	7.16	13.19	19.23
23/08/2010	11h 12m 14.09s	+00° 27' 59.8"	0.4376653	0.6748326	5.61	19.5	10.0	1.6	0.182	129.5	7.11	13.14	19.18
24/08/2010	11h 11m 08.47s	+00° 28' 32.1"	0.4336653	0.6650521	5.53	18.3	10.1	1.8	0.160	132.8	7.06	13.09	19.13
25/08/2010	11h 09m 43.00s	+00° 32' 23.5"	0.4294369	0.6560881	5.46	17.1	10.2	2	0.139	136.2	7.00	13.04	19.08
26/08/2010	11h 07m 58.06s	+00° 39' 40.1"	0.4249894	0.6480414	5.39	15.7	10.4	2.2	0.118	139.8	6.54	12.58	19.02
27/08/2010	11h 05m 54.38s	+00° 50' 25.8"	0.4203328	0.6410189	5.33	14.3	10.5	2.5	0.098	143.5	6.47	12.52	18.57
28/08/2010	11h 03m 33.10s	+01° 04' 41.2"	0.4154787	0.6351324	5.28	12.8	10.6	2.8	0.079	147.4	6.40	12.45	18.51
29/08/2010	11h 00m 55.81s	+01° 22' 23.4"	0.4104401	0.6304973	5.24	11.2	10.7	3.1	0.061	151.3	6.32	12.39	18.46
30/08/2010	10h 58m 04.61s	+01° 43' 25.1"	0.4052317	0.6272303	5.22	9.6	10.7	3.4	0.046	155.3	6.24	12.32	18.40
31/08/2010	10h 55m 02.08s	+02° 07' 34.0"	0.3998701	0.6254470	5.20	8.0	10.7	3.8	0.032	159.4	6.16	12.25	18.35
01/09/2010	10h 51m 51.34s	+02° 34' 32.7"	0.3943739	0.6252585	5.20	6.5	10.8	4.2	0.021	163.2	6.07	12.18	18.29
02/09/2010	10h 48m 35.95s	+03° 03' 58.6"	0.3887638	0.6267688	5.21	5.1	10.7	4.5	0.013	166.7	5.58	12.11	18.24
03/09/2010	10h 45m 19.84s	+03° 35' 24.2"	0.3830632	0.6300707	5.24	4.1	10.7	4.8	0.009	169.1	5.49	12.03	18.19
04/09/2010	10h 42m 07.27s	+04° 08' 17.5"	0.3772978	0.6352428	5.28	3.9	10.6	4.8	0.008	169.5	5.40	11.56	18.14
05/09/2010	10h 39m 02.65s	+04° 42' 03.3"	0.3714966	0.6423461	5.34	4.5	10.5	4.6	0.012	167.6	5.31	11.49	18.09
06/09/2010	10h 36m 10.39s	+05° 16' 04.0"	0.3656912	0.6514216	5.42	5.7	10.3	4.2	0.019	164.1	5.22	11.43	18.05
07/09/2010	10h 33m 34.80s	+05° 49' 41.3"	0.3599166	0.6624878	5.51	7.1	10.1	3.7	0.031	159.7	5.14	11.36	18.00
08/09/2010	10h 31m 19.92s	+06° 22' 17.1"	0.3542109	0.6755396	5.62	8.6	10.0	3.2	0.047	154.9	5.06	11.30	17.56
09/09/2010	10h 29m 29.39s	+06° 53' 15.1"	0.3486155	0.6905470	5.74	10.0	9.7	2.8	0.068	149.8	4.58	11.25	17.53
10/09/2010	10h 28m 06.36s	+07° 22' 01.7"	0.3431748	0.7074555	5.88	11.4	9.5	2.3	0.092	144.6	4.51	11.20	17.49
11/09/2010	10h 27m 13.41s	+07° 48' 06.7"	0.3379361	0.7261861	6.04	12.6	9.3	1.9	0.121	139.3	4.45	11.15	17.46
12/09/2010	10h 26m 52.50s	+08° 11' 04.0"	0.3329490	0.7466358	6.21	13.8	9.0	1.6	0.153	133.9	4.39	11.11	17.44
13/09/2010	10h 27m 04.95s	+08° 30' 31.6"	0.3282649	0.7686796	6.39	14.8	8.7	1.2	0.189	128.5	4.34	11.08	17.41
14/09/2010	10h 27m 51.45s	+08° 46' 12.2"	0.3239361	0.7921712	6.59	15.7	8.5	0.9	0.228	123.0	4.30	11.05	17.39
15/09/2010	10h 29m 12.10s	+08° 57' 52.4"	0.3200145	0.8169457	6.79	16.4	8.2	0.6	0.269	117.5	4.27	11.02	17.38
16/09/2010	10h 31m 06.44s	+09° 05' 23.4"	0.3165506	0.8428214	7.01	17.0	8.0	0.3	0.312	112.1	4.25	11.01	17.36
17/09/2010	10h 33m 33.49s	+09° 08' 40.0"	0.3135918	0.8696030	7.23	17.4	7.7	0.1	0.357	106.6	4.23	10.59	17.35
18/09/2010	10h 36m 31.86s	+09° 07' 40.6"	0.3111807	0.8970851	7.46	17.7	7.5	-0.1	0.403	101.2	4.22	10.59	17.34
19/09/2010	10h 39m 59.77s	+09° 02' 27.4"	0.3093538	0.9250560	7.69	17.8	7.3	-0.2	0.449	95.8	4.22	10.58	17.34
20/09/2010	10h 43m 55.14s	+08° 53' 05.2"	0.3081397	0.9533018	7.93	17.9	7.1	-0.4	0.496	90.5	4.23	10.58	17.33
21/09/2010	10h 48m 15.67s	+08° 39' 41.9"	0.3075578	0.9816117	8.16	17.8	6.9	-0.5	0.541	85.3	4.24	10.59	17.33
22/09/2010	10h 52m 58.91s	+08° 22' 28.0"	0.3076176	1.0097820	8.40	17.6	6.7	-0.6	0.586	80.1	4.26	11.00	17.33
23/09/2010	10h 58m 02.37s	+08° 01' 35.9"	0.3083181	1.0376213	8.63	17.3	6.5	-0.7	0.629	75.1	4.29	11.01	17.33
24/09/2010	11h 03m 23.51s	+07° 37' 19.8"	0.3096479	1.0649537	8.86	16.9	6.3	-0.8	0.669	70.2	4.32	11.03	17.33
25/09/2010	11h 08m 59.87s	+07° 09' 55.0"	0.3115858	1.0916226	9.08	16.4	6.2	-0.9	0.708	65.4	4.35	11.04	17.33
26/09/2010	11h 14m 49.10s	+06° 39' 38.0"	0.3141017	1.1174926	9.29	15.9	6.0	-0.9	0.744	60.8	4.39	11.06	17.33
27/09/2010	11h 20m 49.00s	+06° 06' 45.4"	0.3171578	1.1424508	9.50	15.3	5.9	-1	0.777	56.4	4.43	11.09	17.33
28/09/2010	11h 26m 57.56s	+05° 31' 34.0"	0.3207105	1.1664067	9.70	14.6	5.8	-1	0.807	52.2	4.48	11.11	17.33
29/09/2010	11h 33m 12.96s	+04° 54' 20.3"	0.3247117	1.1892916	9.89	14.0	5.7	-1.1	0.834	48.1	4.52	11.13	17.33
30/09/2010	11h 39m 33.59s	+04° 15' 20.2"	0.3291105	1.2110573	10.07	13.2	5.6	-1.1	0.859	44.2	4.57	11.16	17.33
01/10/2010	11h 45m 58.06s	+03° 34' 48.9"	0.3338549	1.2316734	10.24	12.5	5.5	-1.1	0.881	40.4	5.02	11.18	17.33
02/10/2010	11h 52m 25.17s	+02° 53' 00.5"	0.3388926	1.2511256	10.40	11.7	5.4	-1.1	0.900	36.9	5.07	11.21	17.33
03/10/2010	11h 58m 53.92s	+02° 10' 08.3"	0.3441726	1.2694130									

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase ang°	Rise	Transit	Set
03/11/2010	15h 12m 45.03s	-18° 56' 06.0"	0.4664243	1.4055782	11.69	10.5	4.8	-0.6	0.961	22.8	7.43	12.35	17.25
04/11/2010	15h 18m 55.07s	-19° 26' 15.0"	0.4666734	1.3998747	11.64	11.0	4.8	-0.6	0.957	24.0	7.47	12.37	17.26
05/11/2010	15h 25m 05.70s	-19° 55' 26.8"	0.4666432	1.3936404	11.59	11.6	4.8	-0.5	0.952	25.2	7.52	12.39	17.26
06/11/2010	15h 31m 16.95s	-20° 23' 39.9"	0.4663338	1.3868737	11.53	12.1	4.9	-0.5	0.948	26.5	7.56	12.41	17.26
07/11/2010	15h 37m 28.79s	-20° 50' 53.1"	0.4657454	1.3795721	11.47	12.6	4.9	-0.5	0.943	27.7	8.00	12.44	17.26
08/11/2010	15h 43m 41.22s	-21° 17' 05.1"	0.4648787	1.3717326	11.41	13.1	4.9	-0.5	0.937	29.0	8.04	12.46	17.27
09/11/2010	15h 49m 54.19s	-21° 42' 14.5"	0.4637347	1.3633510	11.34	13.6	4.9	-0.5	0.932	30.2	8.09	12.48	17.27
10/11/2010	15h 56m 07.62s	-22° 06' 20.0"	0.4623149	1.3544228	11.27	14.1	5.0	-0.4	0.926	31.5	8.13	12.51	17.28
11/11/2010	16h 02m 21.44s	-22° 29' 20.1"	0.4606208	1.3449424	11.19	14.6	5.0	-0.4	0.920	32.9	8.17	12.53	17.29
12/11/2010	16h 08m 35.53s	-22° 51' 13.5"	0.4586545	1.3349039	11.10	15.1	5.0	-0.4	0.913	34.2	8.20	12.55	17.29
13/11/2010	16h 14m 49.74s	-23° 11' 58.7"	0.4564187	1.3243006	11.01	15.6	5.1	-0.4	0.906	35.6	8.24	12.57	17.30
14/11/2010	16h 21m 03.91s	-23° 31' 34.3"	0.4539162	1.3131250	10.92	16.1	5.1	-0.4	0.899	37.1	8.28	13.00	17.31
15/11/2010	16h 27m 17.83s	-23° 49' 58.9"	0.4511505	1.3013694	10.82	16.5	5.2	-0.4	0.891	38.5	8.32	13.02	17.32
16/11/2010	16h 33m 31.25s	-24° 07' 11.0"	0.4481258	1.2890256	10.72	17.0	5.2	-0.4	0.883	40.1	8.35	13.04	17.33
17/11/2010	16h 39m 43.90s	-24° 23' 09.2"	0.4448466	1.2760851	10.61	17.4	5.3	-0.4	0.874	41.6	8.39	13.07	17.34
18/11/2010	16h 45m 55.44s	-24° 37' 52.1"	0.4413184	1.2625392	10.50	17.8	5.3	-0.4	0.864	43.3	8.42	13.09	17.35
19/11/2010	16h 52m 05.47s	-24° 51' 18.3"	0.4375472	1.2483791	10.38	18.2	5.4	-0.4	0.854	45.0	8.45	13.11	17.36
20/11/2010	16h 58m 13.56s	-25° 03' 26.4"	0.4335401	1.2335964	10.26	18.6	5.5	-0.4	0.843	46.7	8.49	13.13	17.38
21/11/2010	17h 04m 19.19s	-25° 14' 15.2"	0.4293049	1.2181828	10.13	19.0	5.5	-0.4	0.831	48.6	8.52	13.15	17.39
22/11/2010	17h 10m 21.76s	-25° 23' 43.5"	0.4248508	1.2021311	10.00	19.4	5.6	-0.4	0.818	50.5	8.54	13.17	17.40
23/11/2010	17h 16m 20.61s	-25° 31' 50.1"	0.4201880	1.1854348	9.86	19.7	5.7	-0.4	0.804	52.5	8.57	13.19	17.42
24/11/2010	17h 22m 14.96s	-25° 38' 34.0"	0.4153280	1.1680892	9.72	20.1	5.8	-0.4	0.790	54.6	8.59	13.21	17.43
25/11/2010	17h 28m 03.92s	-25° 43' 54.2"	0.4102840	1.1500913	9.57	20.4	5.8	-0.4	0.774	56.8	8.62	13.23	17.45
26/11/2010	17h 33m 46.50s	-25° 47' 50.2"	0.4050707	1.1314410	9.41	20.6	5.9	-0.4	0.756	59.2	8.64	13.25	17.46
27/11/2010	17h 39m 21.55s	-25° 50' 21.4"	0.3997047	1.1121415	9.25	20.9	6.0	-0.4	0.738	61.6	8.66	13.26	17.47
28/11/2010	17h 44m 47.79s	-25° 51' 27.4"	0.3942045	1.0922006	9.08	21.1	6.2	-0.4	0.718	64.2	8.67	13.28	17.49
29/11/2010	17h 50m 03.75s	-25° 51' 08.3"	0.3885913	1.0716315	8.91	21.2	6.3	-0.4	0.696	66.9	8.68	13.29	17.50
30/11/2010	17h 55m 07.77s	-25° 49' 24.3"	0.3828881	1.0504543	8.74	21.4	6.4	-0.4	0.672	69.8	8.69	13.30	17.51
01/12/2010	17h 59m 57.98s	-25° 46' 16.3"	0.3771211	1.0286979	8.56	21.4	6.5	-0.4	0.647	72.9	8.69	13.31	17.52
02/12/2010	18h 04m 32.29s	-25° 41' 45.1"	0.3713192	1.0064013	8.37	21.5	6.7	-0.4	0.619	76.2	8.70	13.31	17.53
03/12/2010	18h 08m 48.34s	-25° 35' 52.5"	0.3655141	0.9836163	8.18	21.4	6.8	-0.3	0.590	79.6	8.69	13.31	17.54
04/12/2010	18h 12m 43.51s	-25° 28' 40.3"	0.3597408	0.9604100	7.99	21.3	7.0	-0.3	0.558	83.3	8.67	13.31	17.54
05/12/2010	18h 16m 14.92s	-25° 20' 11.1"	0.3540377	0.9368670	7.79	21.0	7.2	-0.3	0.524	87.3	8.64	13.31	17.54
06/12/2010	18h 19m 19.40s	-25° 10' 27.7"	0.3484462	0.9130932	7.60	20.7	7.4	-0.2	0.488	91.4	8.60	13.29	17.54
07/12/2010	18h 21m 53.58s	-24° 59' 33.5"	0.3430108	0.8892181	7.40	20.3	7.6	-0.1	0.449	95.9	8.53	13.28	17.53
08/12/2010	18h 23m 53.96s	-24° 47' 32.1"	0.3377789	0.8653983	7.20	19.7	7.8	0	0.408	100.6	8.45	13.26	17.52
09/12/2010	18h 25m 16.59s	-24° 34' 27.6"	0.3328001	0.8418204	7.00	19.0	8.0	0.1	0.365	105.6	8.36	13.23	17.50
10/12/2010	18h 25m 58.16s	-24° 20' 23.9"	0.3281260	0.8187021	6.81	18.1	8.2	0.3	0.321	110.9	8.31	13.19	17.47
11/12/2010	18h 25m 55.21s	-24° 05' 25.1"	0.3238086	0.7962938	6.62	17.1	8.4	0.5	0.276	116.6	8.26	13.15	17.44
12/12/2010	18h 25m 04.92s	-23° 49' 35.2"	0.3199001	0.7748769	6.45	15.9	8.7	0.8	0.231	122.6	8.20	13.09	17.40
13/12/2010	18h 23m 25.33s	-23° 32' 58.3"	0.3164508	0.7547597	6.28	14.5	8.9	1.1	0.187	128.8	8.13	13.03	17.35
14/12/2010	18h 20m 55.76s	-23° 15' 38.7"	0.3135080	0.7362705	6.12	12.9	9.1	1.5	0.144	135.4	8.25	12.57	17.29
15/12/2010	18h 17m 37.20s	-22° 57' 41.3"	0.3111142	0.7197462	5.99	11.2	9.3	2	0.105	142.2	8.16	12.49	17.23
16/12/2010	18h 13m 32.72s	-22° 39' 12.8"	0.3093056	0.7055169	5.87	9.2	9.5	2.5	0.070	149.3	8.06	12.41	17.16
17/12/2010	18h 08m 47.65s	-22° 20' 22.4"	0.3081104	0.6938878	5.77	7.2	9.7	3.1	0.042	156.5	7.56	12.32	17.08
18/12/2010	18h 03m 29.64s	-22° 01' 22.8"	0.3075480	0.6851185	5.70	5.0	9.8	3.9	0.020	163.6	7.45	12.22	17.00
19/12/2010	17h 57m 48.39s	-21° 42' 30.9"	0.3076274	0.6794037	5.65	3.0	9.9	4.6	0.007	170.2	7.34	12.13	16.52
20/12/2010	17h 51m 55.10s	-21° 24' 08.3"	0.3083474	0.6768570	5.63	2.0	9.9	5	0.003	173.6	7.23	12.03	16.43
21/12/2010	17h 46m 01.63s	-21° 06' 39.3"	0.3096962	0.6775015	5.63	3.2	9.9	4.5	0.008	169.8	7.12	11.53	16.35
22/12/2010	17h 40m 19.63s	-20° 50' 30.1"	0.3116523	0.6812684	5.67	5.3	9.9	3.8	0.021	163.2	7.02	11.44	16.26
23/12/2010	17h 34m 59.66s	-20° 36' 06.0"	0.3141854	0.6880041	5.72	7.4	9.8	3.1	0.043	156.2	6.52	11.35	16.18
24/12/2010	17h 30m 10.50s	-20° 23' 48.6"	0.3172574	0.6974847	5.80	9.5	9.6	2.5	0.070	149.3	6.42	11.26	16.11
25/12/2010	17h 25m 58.83s	-20° 13' 54.5"	0.3208247	0.7094345	5.90	11.5	9.5	2	0.103	142.5	6.34	11.19	16.04
26/12/2010	17h 22m 29.10s	-20° 06' 33.5"	0.3248390	0.7235460	6.02	13.3	9.3	1.6	0.140	136.0	6.26	11.11	15.57
27/12/2010	17h 19m 43.69s	-20° 01' 49.0"	0.3292493	0.7394994	6.15	14.9	9.1	1.2	0.180	129.8	6.19	11.05	15.51
28/12/2010	17h 17m 43.22s	-19° 59' 38.0"	0.3340036	0.7569782	6.29	16.4	8.9	0.9	0.221	124.0	6.13	11.00	15.46
29/12/2010	17h 16m 26.93s	-19° 59' 52.7"	0.3390496	0.7756812	6.45	17.6	8.7	0.7	0.262	118.4	6.08	10.55	15.41
30/12/2010	17h 15m 53.04s	-20° 02' 21.2"	0.3443364	0.7953308	6.61	18.8	8.5	0.5	0.303	113.2	6.04	10.50	15.37
31/12/2010	17h 15m 59.14s	-20° 06' 49.4"	0.3498147	0.8156774	6.78	19.7	8.2	0.3	0.343	108.3	6.01	10.47	15.33

A.R., Dec. = coordinate apparenti  
Distance = distanza dalla Terra in U.A.  
El. = elongazione dal Sole in °  
Mag. = magnitudine

R. = distanza dal Sole in U.A.  
Light = distanza in minuti-luce  
Diam. = diametro in "

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

A.R., Dec. = apparent coordinates  
Distance = distance from the Earth in A.U.  
El. = elongation from the Sun in °  
Mag. = magnitude

R. = distance from the Sun in A.U.  
Light = distance in minutes  
Diam. = diameter in "

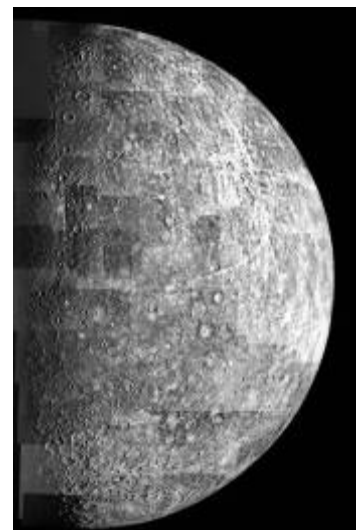
Times of rising and setting of the planet for Rome (42°N, 12°E), in U.T.+1



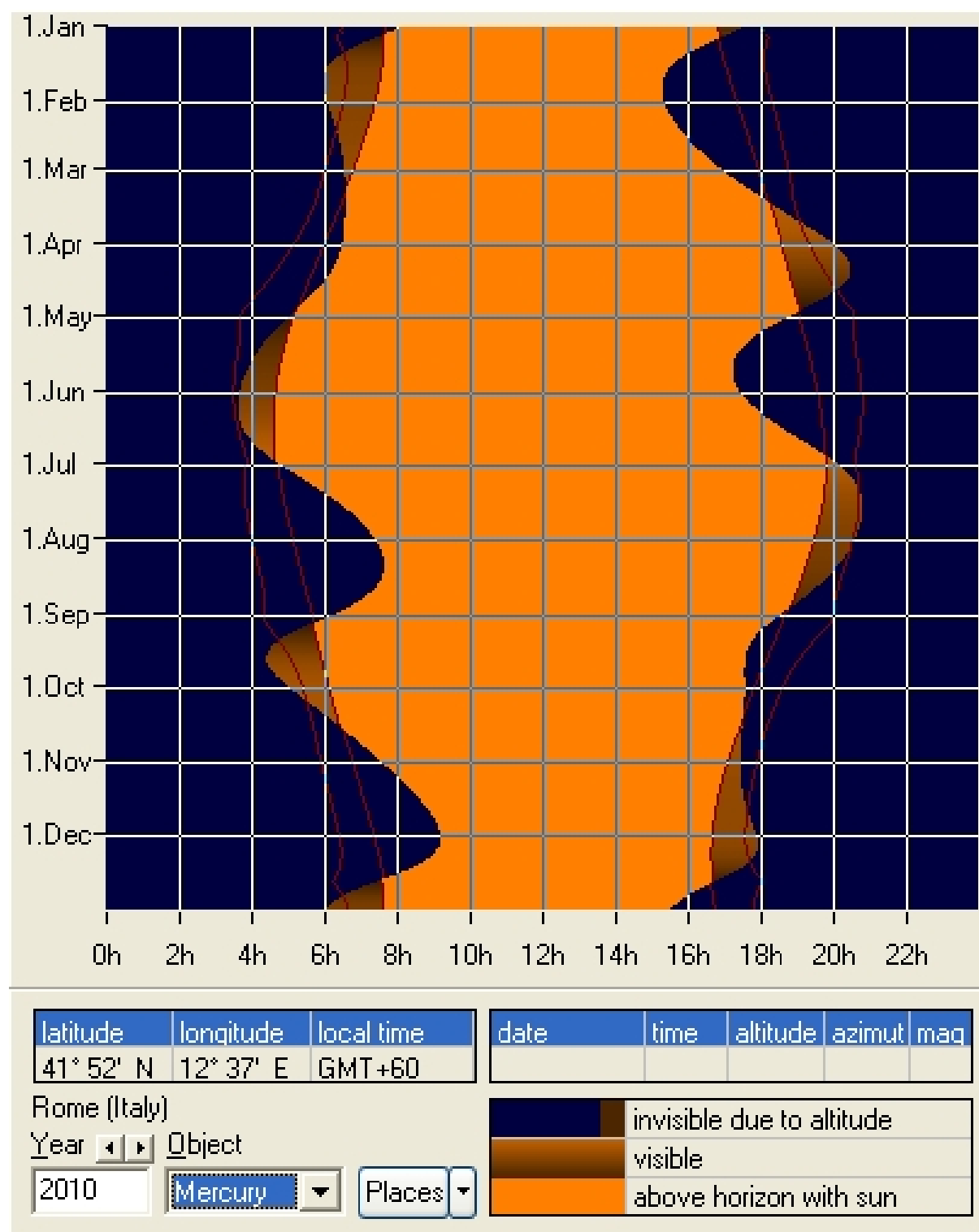
# FENOMENI DI MERCURIO - PHENOMENA OF MERCURY

Perielio - Perihelion	29/03/2010	11.13.20	0.30750 AU	
Perielio - Perihelion	25/06/2010	10.29.03	0.30750 AU	
Perielio - Perihelion	21/09/2010	09.46.24	0.30750 AU	
Perielio - Perihelion	18/12/2010	09.02.27	0.30750 AU	
Afelio - Aphelion	13/02/2010	11.35.58	0.46670 AU	
Afelio - Aphelion	12/05/2010	10.51.17	0.46670 AU	
Afelio - Aphelion	08/08/2010	10.07.27	0.46670 AU	
Afelio - Aphelion	04/11/2010	09.24.36	0.46669 AU	
Perigeo - Perigee	05/01/2010	12.47.33	0.67154 AU	
Perigeo - Perigee	01/05/2010	10.11.55	0.56142 AU	
Perigeo - Perigee	31/08/2010	13.49.06	0.62515 AU	
Perigeo - Perigee	20/12/2010	7.07.18	0.67672 AU	
Apogeo - Apogee	07/03/2010	22.05.39	1.37233 AU	
Apogeo - Apogee	29/06/2010	18.12.37	1.32714 AU	
Apogeo - Apogee	24/10/2010	01.30.36	1.43305 AU	
Magnit. Max - Brightness maximum	15/03/2010	13.00.04	-1.8 mag	
Magnit. Max - Brightness maximum	28/06/2010	06.09.03	-2.2 mag	
Magnit. Max - Brightness maximum	16/10/2010	08.12.19	-1.5 mag	
Magnit. Max - Brightness maximum	26/11/2010	14.08.29	-0.4 mag	
Magnit. Min - Brightness minimum	04/01/2010	16.27.49	4.8 mag	
Magnit. Min - Brightness minimum	28/04/2010	19.11.44	5.9 mag	
Magnit. Min - Brightness minimum	03/09/2010	15.11.34	4.8 mag	
Magnit. Min - Brightness minimum	18/11/2010	17.51.09	-0.4 mag	
Max el. Est - Greatest elong.east	08/04/2010	23.29.50	19.4 °	
Max el. Est - Greatest elong.east	07/08/2010	01.01.22	27.4 °	
Max el. Est - Greatest elong.east	01/12/2010	15.25.53	21.5 °	
Max el. Ovest - Greatest elong. west	27/01/2010	05.37.28	24.8 °	
Max el. Ovest - Greatest elong. west	26/05/2010	02.22.37	25.1 °	
Max el. Ovest - Greatest elong. west	19/09/2010	17.34.20	17.9 °	
Cong. Infer. - Inferior conjunction	04/01/2010	19.06.07		
Cong. Infer. - Inferior conjunction	28/04/2010	16.43.41		
Cong. Infer. - Inferior conjunction	03/09/2010	12.34.53		
Cong. Infer. - Inferior conjunction	20/12/2010	01.23.07		
Cong. Super. - Superior conjunction	14/03/2010	13.16.25		
Cong. Super. - Superior conjunction	28/06/2010	12.06.52		
Cong. Super. - Superior conjunction	17/10/2010	01.04.37		
Moto retrogr. - Retrograde motion	18/04/2010	10.16.25		
Moto retrogr. - Retrograde motion	20/08/2010	03.48.11		
Moto retrogr. - Retrograde motion	10/12/2010	10.17.36		
Moto diretto - Prograde motion	15/01/2010	16.12.17		
Moto diretto - Prograde motion	11/05/2010	00.07.37		
Moto diretto - Prograde motion	12/09/2010	03.09.32		
Moto diretto - Prograde motion	30/12/2010	08.26.21		
Max ang. Fase - Maximum phase angle	04/01/2010	17.19.55	171.4 °	
Max ang. Fase - Maximum phase angle	28/04/2010	17.59.23	177.6 °	
Max ang. Fase - Maximum phase angle	03/09/2010	16.22.00	169.7 °	
Max ang. Fase - Maximum phase angle	19/12/2010	23.53.04	173.4 °	
Min ang. Fase - Minimum phase angle	14/03/2010	15.28.38	4.2 °	
Min ang. Fase - Minimum phase angle	28/06/2010	09.02.48	4.0 °	
Min ang. Fase - Minimum phase angle	17/10/2010	05.15.05	2.1 °	

© (5)



# VISIBILITA' DI MERCURIO - VISIBILITY OF MERCURY



Visibilità di Mercurio nel corso dell'anno - Visibility of Mercury during the year

Le righe rosse più esterne indicano in quali periodi dell'anno il pianeta è sufficientemente distante dal Sole per poter essere osservato agevolmente. Le date esatte sono riportate nelle tabelle seguenti.

The external red lines show in what periods of the year the planet is sufficiently distant from the Sun to be able to be observed easily. The exact dates are in the following tables.

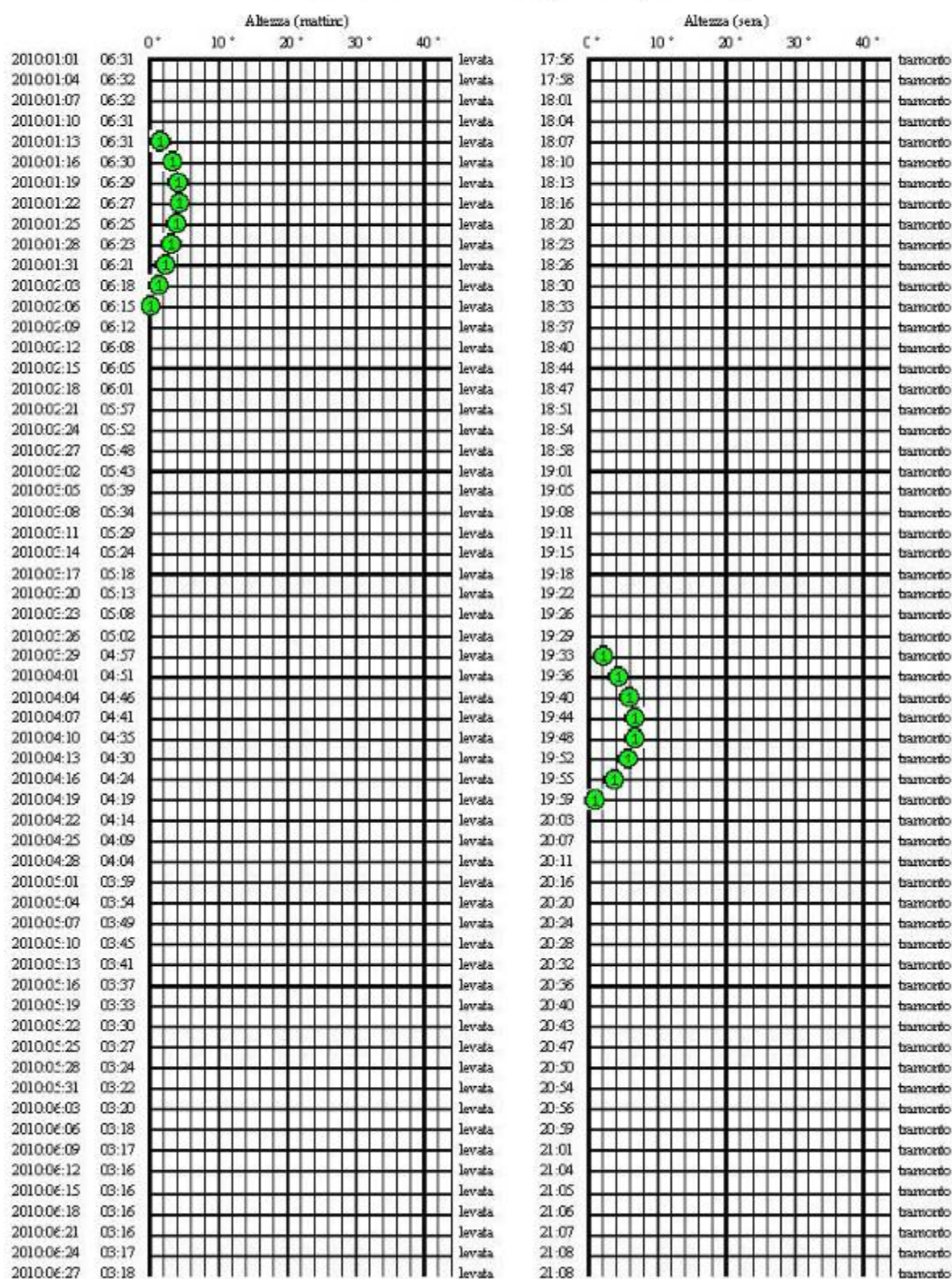


# Altezza ai crepuscoli

## di Mercurio

nel momento il cui il Sole è 12 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)

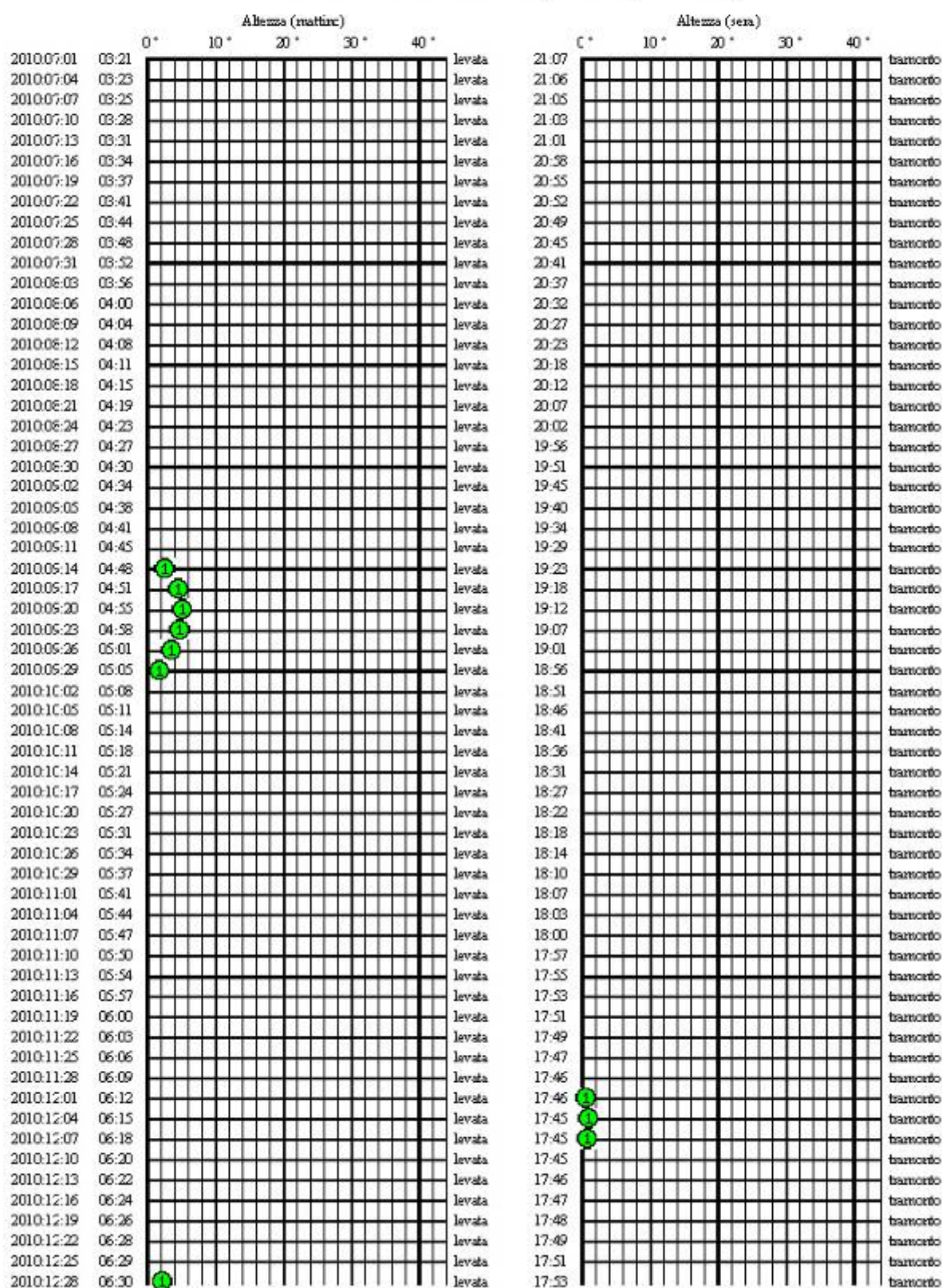


# Altezza ai crepuscoli

## di Mercurio

nel momento il cui il Sole è 12 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



Altezza ai crepuscoli. Il Sole è 12° sotto l'orizzonte

Altitude in the twilights. The Sun is 12° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:01:01	06:31	-16.4	103.0	8.2	17:56	-5.1	247.1	7.3
2010:01:04	06:32	-11.0	107.1	2.9	17:58	-10.3	252.3	2.7
2010:01:07	06:32	-5.8	111.5	6.5	18:01	-15.8	257.3	7.5
2010:01:10	06:31	-1.6	115.6	12.4	18:04	-20.9	261.5	13.3
2010:01:13	06:31	1.5	119.0	17.2	18:07	-25.0	264.7	17.8
2010:01:16	06:30	3.2	121.4	20.6	18:10	-28.2	266.9	21.0
2010:01:19	06:29	4.1	122.9	22.8	18:13	-30.4	268.3	23.1
2010:01:22	06:27	4.2	123.7	24.1	18:16	-32.0	269.1	24.2
2010:01:25	06:25	3.9	123.8	24.7	18:20	-33.0	269.5	24.7
2010:01:28	06:23	3.2	123.4	24.7	18:23	-33.5	269.6	24.7
2010:01:31	06:21	2.3	122.6	24.4	18:26	-33.6	269.6	24.3
2010:02:03	06:18	1.3	121.4	23.8	18:30	-33.4	269.6	23.7
2010:02:06	06:15	0.2	119.9	23.0	18:33	-33.0	269.5	22.8
2010:02:09	06:12	-1.0	118.2	22.0	18:37	-32.3	269.6	21.8
2010:02:12	06:08	-2.2	116.2	20.8	18:40	-31.4	269.7	20.6
2010:02:15	06:05	-3.4	113.9	19.4	18:44	-30.3	269.9	19.2
2010:02:18	06:01	-4.6	111.5	18.0	18:47	-29.0	270.2	17.7
2010:02:21	05:57	-5.8	108.8	16.3	18:51	-27.5	270.6	16.0
2010:02:24	05:52	-6.9	105.8	14.6	18:54	-25.9	271.2	14.2
2010:02:27	05:48	-8.1	102.7	12.7	18:58	-24.1	271.8	12.3
2010:03:02	05:43	-9.2	99.3	10.6	19:01	-22.1	272.5	10.2
2010:03:05	05:39	-10.3	95.7	8.4	19:05	-19.9	273.3	8.0
2010:03:08	05:34	-11.4	91.9	6.0	19:08	-17.5	274.2	5.6
2010:03:11	05:29	-12.4	87.8	3.6	19:11	-15.0	275.1	3.1
2010:03:14	05:24	-13.4	83.5	1.6	19:15	-12.2	276.1	1.5
2010:03:17	05:18	-14.2	79.0	2.8	19:18	-9.3	277.1	3.3
2010:03:20	05:13	-15.0	74.3	5.6	19:22	-6.4	278.2	6.2
2010:03:23	05:08	-15.6	69.5	8.6	19:26	-3.4	279.3	9.2
2010:03:26	05:02	-16.1	64.8	11.5	19:29	-0.5	280.4	12.1
2010:03:29	04:57	-16.4	60.2	14.2	19:33	2.2	281.6	14.7
2010:04:01	04:51	-16.5	56.1	16.5	19:36	4.3	282.9	16.9
2010:04:04	04:46	-16.4	52.6	18.2	19:40	5.9	284.3	18.5
2010:04:07	04:41	-16.2	49.9	19.2	19:44	6.7	285.9	19.3
2010:04:10	04:35	-15.8	48.1	19.3	19:48	6.6	287.6	19.2
2010:04:13	04:30	-15.3	47.3	18.4	19:52	5.6	289.5	18.1
2010:04:16	04:24	-14.7	47.5	16.6	19:55	3.7	291.6	16.1
2010:04:19	04:19	-14.1	48.7	13.9	19:59	0.8	294.0	13.2
2010:04:22	04:14	-13.3	50.8	10.3	20:03	-2.8	296.7	9.4
2010:04:25	04:09	-12.4	53.6	6.0	20:07	-7.0	299.6	4.9
2010:04:28	04:04	-11.4	56.9	1.5	20:11	-11.6	302.8	1.0
2010:05:01	03:59	-10.3	60.4	4.0	20:16	-16.2	306.2	5.0
2010:05:04	03:54	-9.2	63.7	8.7	20:20	-20.4	309.7	9.7
2010:05:07	03:49	-8.2	66.6	13.0	20:24	-24.1	313.3	13.9
2010:05:10	03:45	-7.2	68.9	16.7	20:28	-27.1	316.7	17.5
2010:05:13	03:41	-6.4	70.5	19.7	20:32	-29.3	320.0	20.3
2010:05:16	03:37	-5.6	71.5	22.0	20:36	-30.8	323.1	22.5
2010:05:19	03:33	-5.0	71.9	23.7	20:40	-31.7	325.8	24.0
2010:05:22	03:30	-4.5	71.8	24.7	20:43	-31.9	328.0	24.8
2010:05:25	03:27	-4.1	71.1	25.1	20:47	-31.7	329.9	25.1
2010:05:28	03:24	-3.8	70.0	25.0	20:50	-31.0	331.3	24.9
2010:05:31	03:22	-3.6	68.5	24.5	20:54	-30.0	332.2	24.3
2010:06:03	03:20	-3.5	66.7	23.4	20:56	-28.7	332.6	23.1
2010:06:06	03:18	-3.6	64.5	22.0	20:59	-27.1	332.5	21.6
2010:06:09	03:17	-3.8	62.1	20.2	21:01	-25.2	331.9	19.6
2010:06:12	03:16	-4.2	59.4	17.9	21:04	-23.1	330.8	17.3
2010:06:15	03:16	-4.9	56.4	15.3	21:05	-20.9	329.2	14.6
2010:06:18	03:16	-5.8	53.3	12.3	21:06	-18.6	327.1	11.5
2010:06:21	03:16	-7.0	50.1	9.0	21:07	-16.2	324.6	8.1
2010:06:24	03:17	-8.4	46.8	5.4	21:08	-13.7	321.7	4.6
2010:06:27	03:18	-10.1	43.6	2.0	21:08	-11.4	318.5	1.4
2010:06:30	03:20	-12.0	40.6	2.4	21:07	-9.3	315.1	3.2

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °



Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:07:01	03:21	-12.7	39.7	3.5	21:07	-8.6	314.0	4.3
2010:07:04	03:23	-14.8	37.1	6.9	21:06	-6.8	310.6	7.7
2010:07:07	03:25	-16.9	34.9	10.2	21:05	-5.3	307.1	10.9
2010:07:10	03:28	-19.0	33.2	13.2	21:03	-4.0	303.7	13.9
2010:07:13	03:31	-21.2	31.9	15.9	21:01	-3.0	300.5	16.5
2010:07:16	03:34	-23.3	31.1	18.4	20:58	-2.2	297.3	18.9
2010:07:19	03:37	-25.3	30.7	20.5	20:55	-1.7	294.2	21.0
2010:07:22	03:41	-27.3	30.8	22.4	20:52	-1.4	291.4	22.8
2010:07:25	03:44	-29.1	31.2	24.0	20:49	-1.2	288.6	24.4
2010:07:28	03:48	-30.8	32.1	25.3	20:45	-1.2	286.1	25.6
2010:07:31	03:52	-32.3	33.5	26.3	20:41	-1.4	283.8	26.5
2010:08:03	03:56	-33.6	35.2	27.0	20:37	-1.8	281.7	27.1
2010:08:06	04:00	-34.6	37.4	27.3	20:32	-2.3	279.9	27.4
2010:08:09	04:04	-35.3	40.0	27.3	20:27	-3.0	278.5	27.2
2010:08:12	04:08	-35.5	43.0	26.7	20:23	-3.9	277.4	26.5
2010:08:15	04:11	-35.1	46.4	25.6	20:18	-5.0	276.9	25.3
2010:08:18	04:15	-34.1	50.2	23.9	20:12	-6.3	277.0	23.4
2010:08:21	04:19	-32.3	54.3	21.4	20:07	-7.8	277.8	20.8
2010:08:24	04:23	-29.6	58.5	18.2	20:02	-9.6	279.4	17.4
2010:08:27	04:27	-25.9	62.7	14.1	19:56	-11.5	282.0	13.1
2010:08:30	04:30	-21.3	66.7	9.4	19:51	-13.5	285.3	8.4
2010:09:02	04:34	-16.0	70.5	4.9	19:45	-15.3	289.2	4.3
2010:09:05	04:38	-10.4	73.8	4.7	19:40	-16.8	293.4	5.4
2010:09:08	04:41	-5.2	76.6	8.8	19:34	-17.8	297.0	9.7
2010:09:11	04:45	-0.7	78.8	12.8	19:29	-18.3	299.8	13.5
2010:09:14	04:48	2.6	80.5	15.8	19:23	-18.4	301.2	16.2
2010:09:17	04:51	4.5	81.7	17.4	19:18	-18.1	301.2	17.6
2010:09:20	04:55	5.1	82.7	17.9	19:12	-17.6	299.9	17.8
2010:09:23	04:58	4.7	83.5	17.2	19:07	-17.0	297.6	17.0
2010:09:26	05:01	3.4	84.3	15.8	19:01	-16.3	294.4	15.4
2010:09:29	05:05	1.6	85.0	13.8	18:56	-15.5	290.9	13.4
2010:10:02	05:08	-0.5	85.8	11.6	18:51	-14.7	287.0	11.2
2010:10:05	05:11	-2.8	86.7	9.2	18:46	-14.0	283.1	8.8
2010:10:08	05:14	-5.1	87.7	6.9	18:41	-13.2	279.2	6.4
2010:10:11	05:18	-7.4	88.7	4.5	18:36	-12.5	275.4	4.1
2010:10:14	05:21	-9.6	89.8	2.4	18:31	-11.8	271.7	2.0
2010:10:17	05:24	-11.8	90.8	0.9	18:27	-11.1	268.1	0.9
2010:10:20	05:27	-13.8	91.9	2.2	18:22	-10.5	264.6	2.6
2010:10:23	05:31	-15.7	92.9	4.1	18:18	-9.8	261.3	4.5
2010:10:26	05:34	-17.6	93.9	6.0	18:14	-9.1	258.2	6.3
2010:10:29	05:37	-19.3	94.9	7.8	18:10	-8.4	255.2	8.1
2010:11:01	05:41	-21.0	95.7	9.5	18:07	-7.7	252.3	9.8
2010:11:04	05:44	-22.6	96.5	11.1	18:03	-6.9	249.6	11.4
2010:11:07	05:47	-24.1	97.2	12.7	18:00	-6.1	247.0	13.0
2010:11:10	05:50	-25.5	97.7	14.2	17:57	-5.3	244.5	14.5
2010:11:13	05:54	-26.8	98.1	15.7	17:55	-4.5	242.3	15.9
2010:11:16	05:57	-28.0	98.4	17.0	17:53	-3.6	240.2	17.3
2010:11:19	06:00	-29.1	98.5	18.3	17:51	-2.7	238.3	18.5
2010:11:22	06:03	-30.0	98.5	19.5	17:49	-1.8	236.6	19.6
2010:11:25	06:06	-30.7	98.4	20.4	17:47	-0.9	235.3	20.5
2010:11:28	06:09	-31.1	98.3	21.1	17:46	-0.1	234.3	21.2
2010:12:01	06:12	-31.1	98.1	21.4	17:46	0.5	233.8	21.5
2010:12:04	06:15	-30.5	98.1	21.2	17:45	0.9	233.9	21.1
2010:12:07	06:18	-29.2	98.5	20.1	17:45	0.7	234.8	19.9
2010:12:10	06:20	-26.8	99.5	17.9	17:45	-0.2	236.9	17.4
2010:12:13	06:22	-23.2	101.4	14.2	17:46	-2.3	240.2	13.4
2010:12:16	06:24	-18.3	104.3	8.8	17:47	-5.6	244.7	7.8
2010:12:19	06:26	-12.4	108.1	2.7	17:48	-10.1	250.1	2.1
2010:12:22	06:28	-6.4	112.3	5.8	17:49	-14.9	255.4	6.8
2010:12:25	06:29	-1.4	116.2	11.9	17:51	-19.4	260.0	12.7
2010:12:28	06:30	2.1	119.5	16.7	17:53	-23.1	263.3	17.3
2010:12:31	06:31	4.2	122.0	19.9	17:55	-25.9	265.4	20.3

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

# Altezza ai crepuscoli

## di Mercurio

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)

		Altezza (mattino)					Altezza (sera)						
		0°	10°	20°	30°	40°		0°	10°	20°	30°	40°	
2010-01-01	05:57						levata	18:30					tramonto
2010-01-04	05:58						levata	18:32					tramonto
2010-01-07	05:58						levata	18:35					tramonto
2010-01-10	05:58						levata	18:37					tramonto
2010-01-13	05:57						levata	18:40					tramonto
2010-01-16	05:56						levata	18:43					tramonto
2010-01-19	05:55						levata	18:46					tramonto
2010-01-22	05:54						levata	18:49					tramonto
2010-01-25	05:52						levata	18:53					tramonto
2010-01-28	05:50						levata	18:56					tramonto
2010-01-31	05:48						levata	18:59					tramonto
2010-02-03	05:45						levata	19:02					tramonto
2010-02-06	05:42						levata	19:06					tramonto
2010-02-09	05:39						levata	19:09					tramonto
2010-02-12	05:36						levata	19:13					tramonto
2010-02-15	05:32						levata	19:16					tramonto
2010-02-18	05:28						levata	19:19					tramonto
2010-02-21	05:24						levata	19:23					tramonto
2010-02-24	05:20						levata	19:26					tramonto
2010-02-27	05:16						levata	19:30					tramonto
2010-03-02	05:11						levata	19:33					tramonto
2010-03-05	05:06						levata	19:37					tramonto
2010-03-08	05:01						levata	19:41					tramonto
2010-03-11	04:56						levata	19:44					tramonto
2010-03-14	04:51						levata	19:48					tramonto
2010-03-17	04:45						levata	19:51					tramonto
2010-03-20	04:40						levata	19:55					tramonto
2010-03-23	04:34						levata	19:59					tramonto
2010-03-26	04:29						levata	20:03					tramonto
2010-03-29	04:23						levata	20:07					tramonto
2010-04-01	04:17						levata	20:11					tramonto
2010-04-04	04:11						levata	20:15					tramonto
2010-04-07	04:05						levata	20:19					tramonto
2010-04-10	03:59						levata	20:24					tramonto
2010-04-13	03:53						levata	20:28					tramonto
2010-04-16	03:47						levata	20:32					tramonto
2010-04-19	03:41						levata	20:37					tramonto
2010-04-22	03:35						levata	20:42					tramonto
2010-04-25	03:30						levata	20:46					tramonto
2010-04-28	03:24						levata	20:51					tramonto
2010-05-01	03:18						levata	20:56					tramonto
2010-05-04	03:13						levata	21:01					tramonto
2010-05-07	03:07						levata	21:06					tramonto
2010-05-10	03:02						levata	21:11					tramonto
2010-05-13	02:57						levata	21:16					tramonto
2010-05-16	02:52						levata	21:21					tramonto
2010-05-19	02:47						levata	21:26					tramonto
2010-05-22	02:43						levata	21:30					tramonto
2010-05-25	02:39						levata	21:35					tramonto
2010-05-28	02:35						levata	21:39					tramonto
2010-05-31	02:32						levata	21:43					tramonto
2010-06-03	02:29						levata	21:47					tramonto
2010-06-06	02:27						levata	21:51					tramonto
2010-06-09	02:25						levata	21:54					tramonto
2010-06-12	02:23						levata	21:56					tramonto
2010-06-15	02:23						levata	21:58					tramonto
2010-06-18	02:22						levata	22:00					tramonto
2010-06-21	02:23						levata	22:01					tramonto
2010-06-24	02:24						levata	22:01					tramonto
2010-06-27	02:25						levata	22:01					tramonto

# Altezza ai crepuscoli

## di Mercurio

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)

		Altezza (mattino)					Altezza (sera)						
		0°	10°	20°	30°	40°		0°	10°	20°	30°	40°	
2010-07-01	02:28						levata	22:00					tramonto
2010-07-04	02:31						levata	21:58					tramonto
2010-07-07	02:34						levata	21:56					tramonto
2010-07-10	02:37						levata	21:54					tramonto
2010-07-13	02:41						levata	21:51					tramonto
2010-07-16	02:45						levata	21:47					tramonto
2010-07-19	02:49						levata	21:43					tramonto
2010-07-22	02:54						levata	21:39					tramonto
2010-07-25	02:59						levata	21:35					tramonto
2010-07-28	03:03						levata	21:30					tramonto
2010-07-31	03:08						levata	21:25					tramonto
2010-08-03	03:13						levata	21:20					tramonto
2010-08-06	03:18						levata	21:14					tramonto
2010-08-09	03:23						levata	21:09					tramonto
2010-08-12	03:27						levata	21:03					tramonto
2010-08-15	03:32						levata	20:57					tramonto
2010-08-18	03:37						levata	20:51					tramonto
2010-08-21	03:41						levata	20:45					tramonto
2010-08-24	03:45						levata	20:39					tramonto
2010-08-27	03:50						levata	20:33					tramonto
2010-08-30	03:54						levata	20:27					tramonto
2010-09-02	03:58						levata	20:21					tramonto
2010-09-05	04:02						levata	20:15					tramonto
2010-09-08	04:06						levata	20:09					tramonto
2010-09-11	04:10						levata	20:03					tramonto
2010-09-14	04:14						levata	19:57					tramonto
2010-09-17	04:18						levata	19:51					tramonto
2010-09-20	04:21						levata	19:46					tramonto
2010-09-23	04:25						levata	19:40					tramonto
2010-09-26	04:28						levata	19:34					tramonto
2010-09-29	04:32						levata	19:29					tramonto
2010-10-02	04:35						levata	19:24					tramonto
2010-10-05	04:39						levata	19:18					tramonto
2010-10-08	04:42						levata	19:13					tramonto
2010-10-11	04:45						levata	19:08					tramonto
2010-10-14	04:49						levata	19:04					tramonto
2010-10-17	04:52						levata	18:59					tramonto
2010-10-20	04:55						levata	18:55					tramonto
2010-10-23	04:58						levata	18:50					tramonto
2010-10-26	05:02						levata	18:46					tramonto
2010-10-29	05:05						levata	18:43					tramonto
2010-11-01	05:08						levata	18:39					tramonto
2010-11-04	05:11						levata	18:36					tramonto
2010-11-07	05:15						levata	18:33					tramonto
2010-11-10	05:18						levata	18:30					tramonto
2010-11-13	05:21						levata	18:28					tramonto
2010-11-16	05:24						levata	18:26					tramonto
2010-11-19	05:27						levata	18:24					tramonto
2010-11-22	05:30						levata	18:22					tramonto
2010-11-25	05:33						levata	18:21					tramonto
2010-11-28	05:36						levata	18:20					tramonto
2010-12-01	05:39						levata	18:19					tramonto
2010-12-04	05:41						levata	18:19					tramonto
2010-12-07	05:44						levata	18:19					tramonto
2010-12-10	05:46						levata	18:19					tramonto
2010-12-13	05:49						levata	18:20					tramonto
2010-12-16	05:51						levata	18:21					tramonto
2010-12-19	05:52						levata	18:22					tramonto
2010-12-22	05:54						levata	18:23					tramonto
2010-12-25	05:55						levata	18:25					tramonto
2010-12-28	05:56						levata	18:27					tramonto

Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:01:01	05:57	-22.6	97.8	8.3	18:30	-11.1	252.5	7.3
2010:01:04	05:58	-17.2	101.8	2.9	18:32	-16.4	257.6	2.7
2010:01:07	05:58	-11.8	106.2	6.5	18:35	-22.0	262.6	7.5
2010:01:10	05:58	-7.3	110.2	12.4	18:37	-27.1	266.9	13.3
2010:01:13	05:57	-4.2	113.4	17.2	18:40	-31.3	270.2	17.9
2010:01:16	05:56	-2.2	115.8	20.6	18:43	-34.4	272.5	21.0
2010:01:19	05:55	-1.3	117.3	22.8	18:46	-36.6	273.9	23.1
2010:01:22	05:54	-1.1	118.0	24.1	18:49	-38.1	274.8	24.2
2010:01:25	05:52	-1.4	118.2	24.7	18:53	-39.1	275.2	24.7
2010:01:28	05:50	-2.1	117.9	24.7	18:56	-39.6	275.3	24.7
2010:01:31	05:48	-3.0	117.1	24.4	18:59	-39.7	275.3	24.3
2010:02:03	05:45	-4.0	116.0	23.8	19:02	-39.5	275.2	23.7
2010:02:06	05:42	-5.2	114.6	23.0	19:06	-39.0	275.1	22.8
2010:02:09	05:39	-6.4	112.9	22.0	19:09	-38.3	275.1	21.8
2010:02:12	05:36	-7.7	111.0	20.8	19:13	-37.4	275.3	20.6
2010:02:15	05:32	-9.0	108.8	19.5	19:16	-36.3	275.5	19.2
2010:02:18	05:28	-10.2	106.3	18.0	19:19	-35.0	275.8	17.7
2010:02:21	05:24	-11.5	103.6	16.4	19:23	-33.5	276.2	16.0
2010:02:24	05:20	-12.8	100.7	14.6	19:26	-31.9	276.8	14.2
2010:02:27	05:16	-14.0	97.5	12.7	19:30	-30.0	277.4	12.3
2010:03:02	05:11	-15.2	94.1	10.6	19:33	-28.0	278.2	10.2
2010:03:05	05:06	-16.4	90.4	8.4	19:37	-25.9	279.0	7.9
2010:03:08	05:01	-17.5	86.5	6.1	19:41	-23.5	279.9	5.6
2010:03:11	04:56	-18.5	82.3	3.6	19:44	-20.9	280.9	3.1
2010:03:14	04:51	-19.4	77.8	1.6	19:48	-18.2	281.9	1.5
2010:03:17	04:45	-20.2	73.0	2.8	19:51	-15.4	282.9	3.4
2010:03:20	04:40	-20.9	68.1	5.6	19:55	-12.4	284.0	6.2
2010:03:23	04:34	-21.3	63.1	8.6	19:59	-9.4	285.0	9.2
2010:03:26	04:29	-21.6	58.1	11.5	20:03	-6.5	286.2	12.1
2010:03:29	04:23	-21.7	53.4	14.2	20:07	-3.9	287.4	14.8
2010:04:01	04:17	-21.6	49.0	16.5	20:11	-1.8	288.6	16.9
2010:04:04	04:11	-21.3	45.4	18.2	20:15	-0.3	290.1	18.5
2010:04:07	04:05	-20.9	42.5	19.2	20:19	0.5	291.6	19.3
2010:04:10	03:59	-20.5	40.6	19.3	20:24	0.4	293.4	19.2
2010:04:13	03:53	-20.0	39.7	18.5	20:28	-0.6	295.5	18.1
2010:04:16	03:47	-19.5	39.8	16.7	20:32	-2.6	297.8	16.1
2010:04:19	03:41	-19.0	40.9	13.9	20:37	-5.4	300.5	13.1
2010:04:22	03:35	-18.5	43.0	10.3	20:42	-9.0	303.5	9.3
2010:04:25	03:30	-17.9	45.8	6.0	20:46	-13.1	306.9	4.9
2010:04:28	03:24	-17.3	49.1	1.5	20:51	-17.6	310.6	1.0
2010:05:01	03:18	-16.6	52.6	3.9	20:56	-21.9	314.7	5.1
2010:05:04	03:13	-15.9	55.9	8.6	21:01	-25.9	319.0	9.7
2010:05:07	03:07	-15.2	58.7	12.9	21:06	-29.3	323.3	13.9
2010:05:10	03:02	-14.5	61.0	16.7	21:11	-32.0	327.6	17.5
2010:05:13	02:57	-13.9	62.6	19.7	21:16	-33.9	331.6	20.3
2010:05:16	02:52	-13.4	63.4	22.0	21:21	-35.1	335.3	22.5
2010:05:19	02:47	-13.0	63.7	23.6	21:26	-35.7	338.5	24.0
2010:05:22	02:43	-12.6	63.4	24.7	21:30	-35.7	341.2	24.8
2010:05:25	02:39	-12.3	62.6	25.1	21:35	-35.3	343.4	25.1
2010:05:28	02:35	-12.1	61.3	25.0	21:39	-34.4	344.9	24.9
2010:05:31	02:32	-11.9	59.6	24.5	21:43	-33.3	345.9	24.2
2010:06:03	02:29	-11.8	57.6	23.5	21:47	-32.0	346.3	23.1
2010:06:06	02:27	-11.9	55.3	22.0	21:51	-30.4	346.0	21.6
2010:06:09	02:25	-12.0	52.6	20.2	21:54	-28.7	345.2	19.6
2010:06:12	02:23	-12.2	49.8	17.9	21:56	-26.9	343.9	17.3
2010:06:15	02:23	-12.6	46.6	15.3	21:58	-25.0	341.9	14.5
2010:06:18	02:22	-13.2	43.3	12.3	22:00	-23.0	339.4	11.4
2010:06:21	02:23	-14.0	39.8	9.0	22:01	-21.0	336.4	8.1
2010:06:24	02:24	-15.0	36.3	5.5	22:01	-19.1	333.1	4.5
2010:06:27	02:25	-16.2	32.9	2.1	22:01	-17.2	329.4	1.4
2010:06:30	02:27	-17.7	29.7	2.4	22:00	-15.6	325.6	3.3

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:07:01	02:28	-18.2	28.7	3.5	22:00	-15.0	324.3	4.4
2010:07:04	02:31	-19.8	25.9	6.9	21:58	-13.6	320.5	7.8
2010:07:07	02:34	-21.5	23.5	10.1	21:56	-12.4	316.7	11.0
2010:07:10	02:37	-23.3	21.5	13.1	21:54	-11.4	312.9	13.9
2010:07:13	02:41	-25.2	20.1	15.9	21:51	-10.6	309.4	16.6
2010:07:16	02:45	-27.1	19.1	18.3	21:47	-10.0	305.9	18.9
2010:07:19	02:49	-29.0	18.6	20.5	21:43	-9.5	302.6	21.0
2010:07:22	02:54	-30.9	18.5	22.4	21:39	-9.2	299.5	22.8
2010:07:25	02:59	-32.7	19.0	24.0	21:35	-9.1	296.6	24.4
2010:07:28	03:03	-34.5	19.8	25.3	21:30	-9.1	293.8	25.6
2010:07:31	03:08	-36.1	21.2	26.3	21:25	-9.2	291.3	26.5
2010:08:03	03:13	-37.5	23.0	27.0	21:20	-9.5	289.1	27.1
2010:08:06	03:18	-38.7	25.4	27.3	21:14	-9.9	287.1	27.4
2010:08:09	03:23	-39.6	28.2	27.3	21:09	-10.5	285.5	27.2
2010:08:12	03:27	-40.0	31.6	26.7	21:03	-11.3	284.4	26.5
2010:08:15	03:32	-40.0	35.5	25.6	20:57	-12.2	283.7	25.3
2010:08:18	03:37	-39.3	39.9	23.9	20:51	-13.4	283.7	23.4
2010:08:21	03:41	-37.7	44.6	21.5	20:45	-14.8	284.5	20.8
2010:08:24	03:45	-35.3	49.6	18.2	20:39	-16.4	286.1	17.3
2010:08:27	03:50	-31.8	54.5	14.1	20:33	-18.1	288.6	13.1
2010:08:30	03:54	-27.4	59.3	9.4	20:27	-19.9	292.1	8.3
2010:09:02	03:58	-22.2	63.6	4.9	20:21	-21.5	296.1	4.3
2010:09:05	04:02	-16.7	67.4	4.7	20:15	-22.7	300.4	5.4
2010:09:08	04:06	-11.4	70.5	8.8	20:09	-23.4	304.1	9.7
2010:09:11	04:10	-6.9	72.9	12.8	20:03	-23.7	306.9	13.6
2010:09:14	04:14	-3.6	74.7	15.8	19:57	-23.6	308.3	16.2
2010:09:17	04:18	-1.7	76.1	17.4	19:51	-23.3	308.2	17.6
2010:09:20	04:21	-1.0	77.2	17.9	19:46	-22.8	306.7	17.8
2010:09:23	04:25	-1.4	78.0	17.2	19:40	-22.3	304.2	17.0
2010:09:26	04:28	-2.6	78.8	15.8	19:34	-21.7	300.9	15.4
2010:09:29	04:32	-4.4	79.5	13.8	19:29	-21.1	297.1	13.4
2010:10:02	04:35	-6.5	80.3	11.6	19:24	-20.4	293.1	11.1
2010:10:05	04:39	-8.8	81.2	9.3	19:18	-19.8	289.0	8.8
2010:10:08	04:42	-11.1	82.2	6.9	19:13	-19.1	285.0	6.4
2010:10:11	04:45	-13.4	83.2	4.6	19:08	-18.5	281.0	4.1
2010:10:14	04:49	-15.6	84.3	2.4	19:04	-17.8	277.2	2.0
2010:10:17	04:52	-17.7	85.4	0.9	18:59	-17.1	273.5	0.9
2010:10:20	04:55	-19.8	86.5	2.2	18:55	-16.4	269.9	2.6
2010:10:23	04:58	-21.7	87.6	4.1	18:50	-15.7	266.6	4.5
2010:10:26	05:02	-23.6	88.6	6.0	18:46	-15.0	263.4	6.3
2010:10:29	05:05	-25.3	89.6	7.8	18:43	-14.3	260.3	8.1
2010:11:01	05:08	-27.0	90.5	9.5	18:39	-13.5	257.4	9.8
2010:11:04	05:11	-28.6	91.3	11.1	18:36	-12.7	254.7	11.4
2010:11:07	05:15	-30.1	92.0	12.7	18:33	-11.8	252.1	13.0
2010:11:10	05:18	-31.5	92.5	14.2	18:30	-10.9	249.7	14.5
2010:11:13	05:21	-32.9	93.0	15.7	18:28	-10.0	247.4	15.9
2010:11:16	05:24	-34.1	93.3	17.0	18:26	-9.1	245.4	17.3
2010:11:19	05:27	-35.2	93.4	18.3	18:24	-8.1	243.5	18.5
2010:11:22	05:30	-36.1	93.4	19.4	18:22	-7.1	241.9	19.6
2010:11:25	05:33	-36.8	93.3	20.4	18:21	-6.2	240.6	20.6
2010:11:28	05:36	-37.3	93.1	21.1	18:20	-5.3	239.7	21.2
2010:12:01	05:39	-37.3	92.9	21.4	18:19	-4.7	239.2	21.5
2010:12:04	05:41	-36.8	92.9	21.2	18:19	-4.4	239.4	21.1
2010:12:07	05:44	-35.5	93.3	20.2	18:19	-4.6	240.4	19.9
2010:12:10	05:46	-33.1	94.3	17.9	18:19	-5.7	242.4	17.4
2010:12:13	05:49	-29.5	96.2	14.2	18:20	-7.9	245.6	13.4
2010:12:16	05:51	-24.5	99.1	8.8	18:21	-11.5	250.1	7.8
2010:12:19	05:52	-18.5	102.9	2.7	18:22	-16.1	255.4	2.1
2010:12:22	05:54	-12.4	106.9	5.7	18:23	-21.1	260.7	6.8
2010:12:25	05:55	-7.2	110.7	11.8	18:25	-25.7	265.3	12.8
2010:12:28	05:56	-3.5	113.9	16.6	18:27	-29.4	268.8	17.3
2010:12:31	05:57	-1.3	116.3	19.9	18:29	-32.2	270.9	20.3

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °



heliacal dates for Mercury in 2010  
location : Rome (Italy)  
latitude : 41° 52' 12'' N  
longitude: 12° 37' 12'' E  
variable arcus visionis:  
arcvis [°] = 10.5 + 1.4 \* magnitude  
critical altitude: 0.00°

date eliache per Mercurio  
posizione : Roma  
latitudine : 41° 52' 12'' N  
longitudine: 12° 37' 12'' E

visibilità minima [°] = 10.5 + 1.4 \* magnitudine  
altezza critica : 0.00°

	date	obj r/s	sun r/s	d r/s	age	mag
morning visibility begins	2010-01-12	06:23	07:36	-1:12h	7d 10h	1.0
morning visibility ends	2010-02-11	06:16	07:10	-0:54h	-31d 08h	-0.1
evening visibility begins	2010-03-23	19:09	18:24	0:45h	9d 05h	-1.4
evening visibility ends	2010-04-19	20:06	18:54	1:11h	-8d 22h	1.8
evening visibility begins	2010-07-13	20:44	19:44	1:00h	15d 08h	-0.5
evening visibility ends	2010-08-01	20:33	19:28	1:04h	-32d 17h	0.4
morning visibility begins	2010-09-12	04:39	05:46	-1:06h	8d 15h	1.1
morning visibility ends	2010-10-05	05:23	06:10	-0:46h	-11d 20h	-1.1
evening visibility begins	2010-11-21	17:38	16:44	0:54h	35d 16h	-0.3
evening visibility ends	2010-12-11	17:43	16:38	1:05h	-8d 09h	0.6
morning visibility begins	2010-12-26	06:26	07:36	-1:09h	6d 04h	1.1

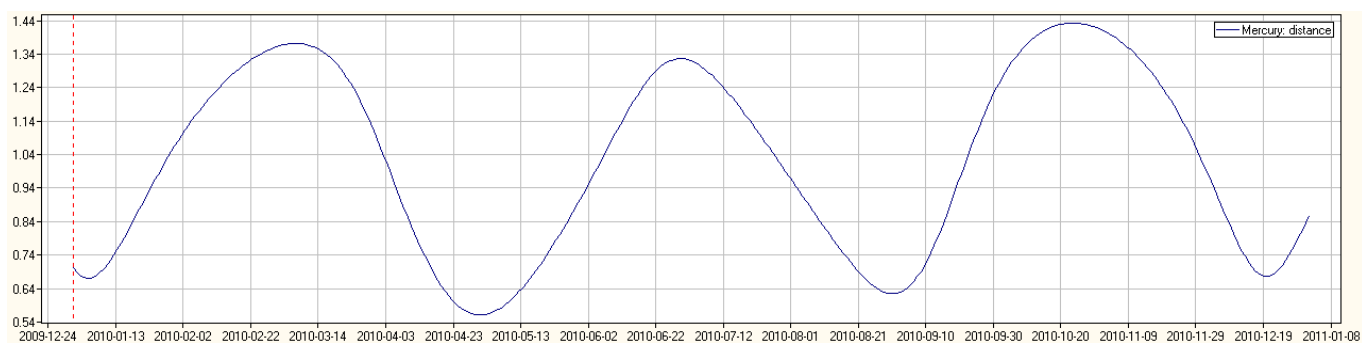
Date : data nel formato mese/giorno  
Obj r/s : ora del tramonto o della levata del pianeta  
Sun r/s: ora del tramonto o della levata del Sole  
D r/s : differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due oggetti  
Age : giorni trascorsi dalla congiunzione col Sole  
Mag : magnitudine  
Morning visibility begins = inizio visibilità mattutina  
Morning visibility ends = fine visibilità mattutina  
Evening visibility begins = inizio visibilità serale  
Evening visibility ends = fine visibilità serale

Obj r/s : rising and setting of the planet  
Sun r/s : sunrise and sunset  
D r/s : difference in hours and minutes between the instants of the rising or the setting of the two objects  
Age : days from the conjunction with the Sun  
Mag : magnitude

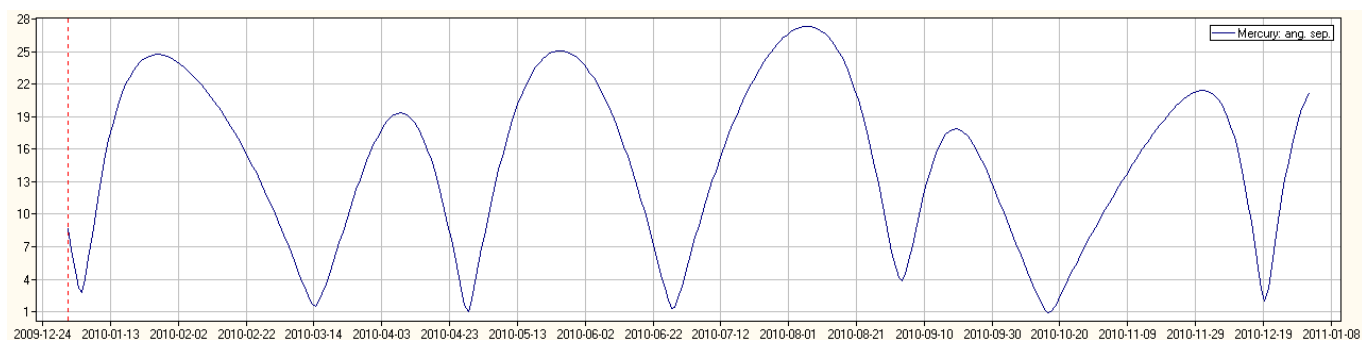
	date	obj r/s	sun r/s	sun alt	sun lon	obj lon	obj lat	mag	d az	d lon
MF	01-12	06:23	07:36	-13° 13'	291° 53'	276° 28'	3° 17'	1.0	9° 26'	-15° 25'
ML	02-11	06:16	07:10	-10° 40'	322° 22'	301° 11'	-1° 02'	-0.1	18° 43'	-21° 11'
EF	03-23	19:09	18:24	-9° 06'	3° 00'	12° 10'	-0° 12'	-1.4	-3° 13'	9° 10'
EL	04-19	20:06	18:54	-13° 11'	29° 37'	42° 30'	2° 47'	1.8	-3° 27'	12° 53'
EF	07-13	20:44	19:44	-9° 54'	111° 18'	127° 44'	1° 43'	-0.5	-13° 38'	16° 26'
EL	08-01	20:33	19:28	-11° 13'	129° 27'	156° 12'	-0° 38'	0.4	-24° 41'	26° 46'
MF	09-12	04:39	05:46	-12° 57'	169° 17'	155° 25'	-1° 23'	1.1	6° 22'	-13° 52'
ML	10-05	05:23	06:10	-9° 35'	191° 50'	182° 46'	1° 49'	-1.1	1° 10'	-9° 03'
EF	11-21	17:38	16:44	-10° 12'	239° 16'	258° 23'	-2° 26'	-0.3	-16° 45'	19° 07'
EL	12-11	17:43	16:38	-11° 43'	259° 32'	275° 49'	-0° 36'	0.6	-11° 55'	16° 16'
MF	12-26	06:26	07:36	-12° 29'	274° 19'	261° 01'	3° 03'	1.1	6° 37'	-13° 18'

MF : prima visibilità mattutina  
ML : ultima visibilità mattutina  
EF : prima visibilità serale  
EL : ultima visibilità serale  
Date : data nel formato mese/giorno  
Sun alt : altezza del Sole nell'istante di visibilità del pianeta  
Sun lon : longitudine celeste del Sole  
Obj lon : longitudine celeste del pianeta  
Obj lat : latitudine celeste del pianeta  
Mag : magnitudine  
D az : differenza in azimut tra i centri del Sole e del pianeta nell'istante della sua visibilità  
D lon : differenza in longitudine tra i centri del Sole e del pianeta nell'istante della sua visibilità

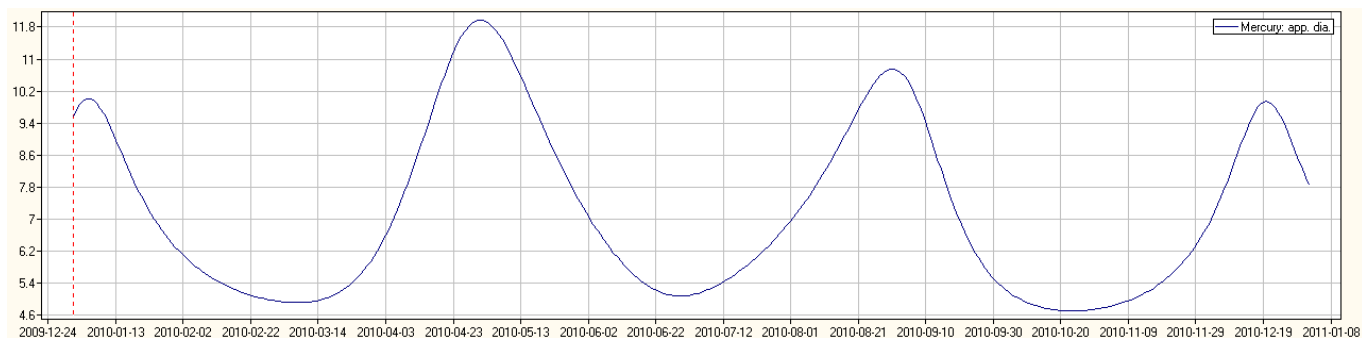
Date : date in the format month/day  
Sun alt : altitude of the Sun in the instant of visibility of the planet  
Sun lon : celestial longitude of the Sun  
Obj lon : celestial longitude of the planet  
Obj lat : Celestial latitude of the planet  
Mag : magnitude  
D az : difference in azimuth between the centers of the Sun and the planet in the instant of its visibility  
D lon : difference in longitude between the centers of the Sun and the planet in the instant of its visibility



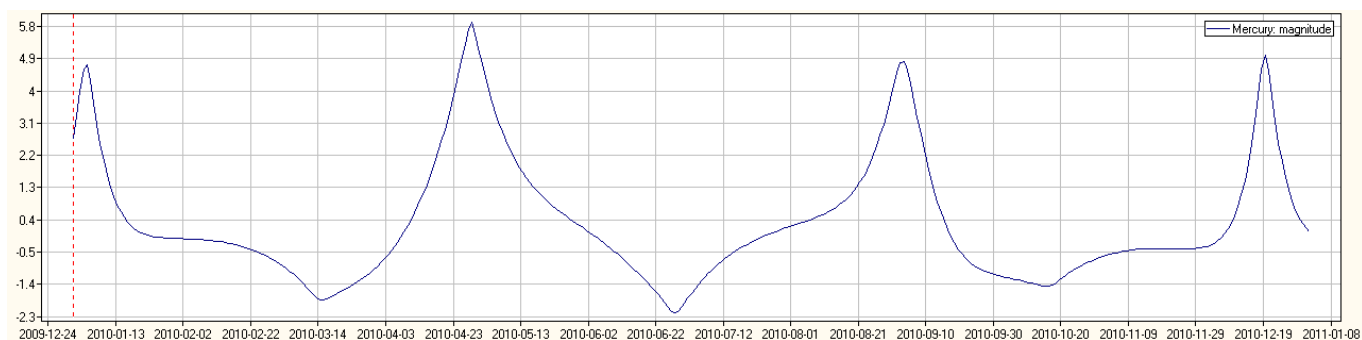
Distanza di Mercurio in U.A. nel corso dell'anno - Distance of Mercury in A.U. during the year



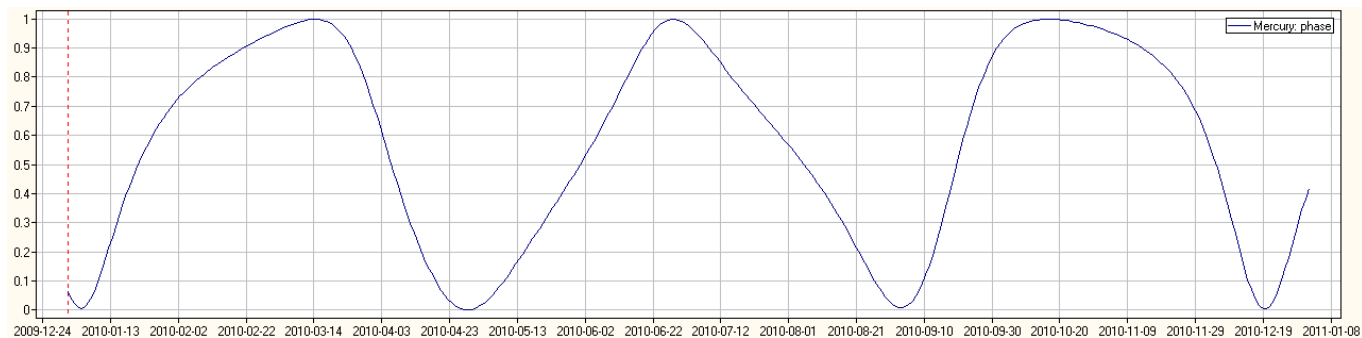
Elongazione di Mercurio in ° nel corso dell'anno - Elongation of Mercury in ° during the year



Diametro di Mercurio in " nel corso dell'anno - Diameter of Mercury in " during the year



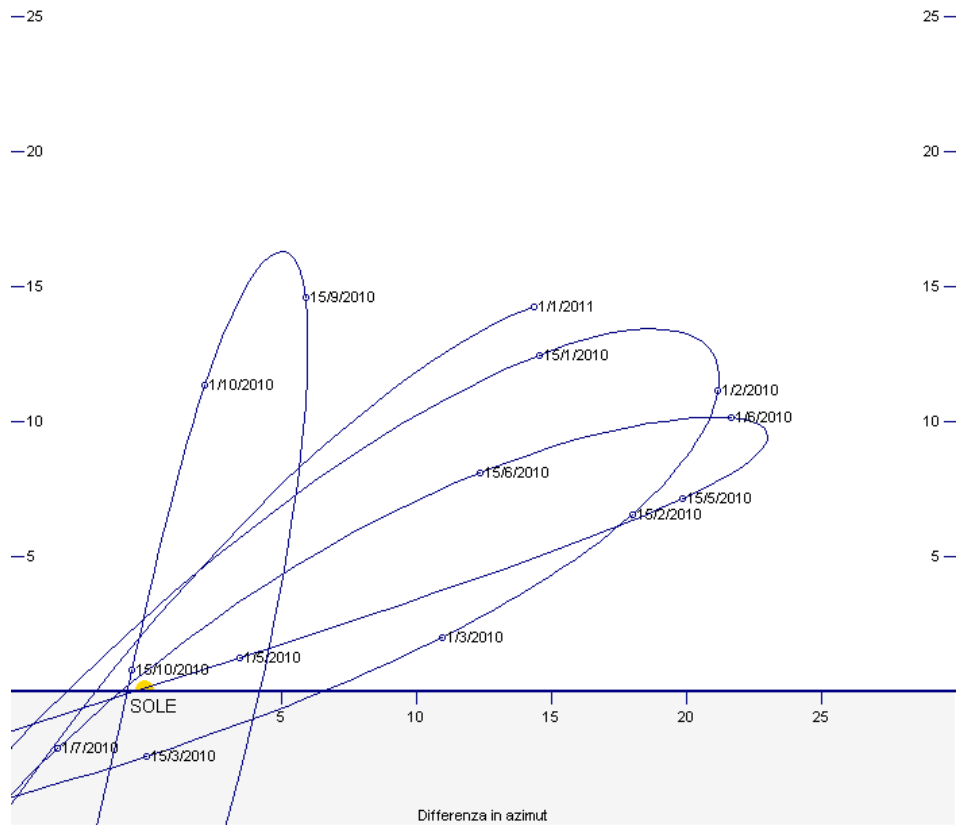
Magnitudine di Mercurio nel corso dell'anno - Magnitude of Mercury during the year



Fase di Mercurio nel corso dell'anno - Phase of Mercury during the year

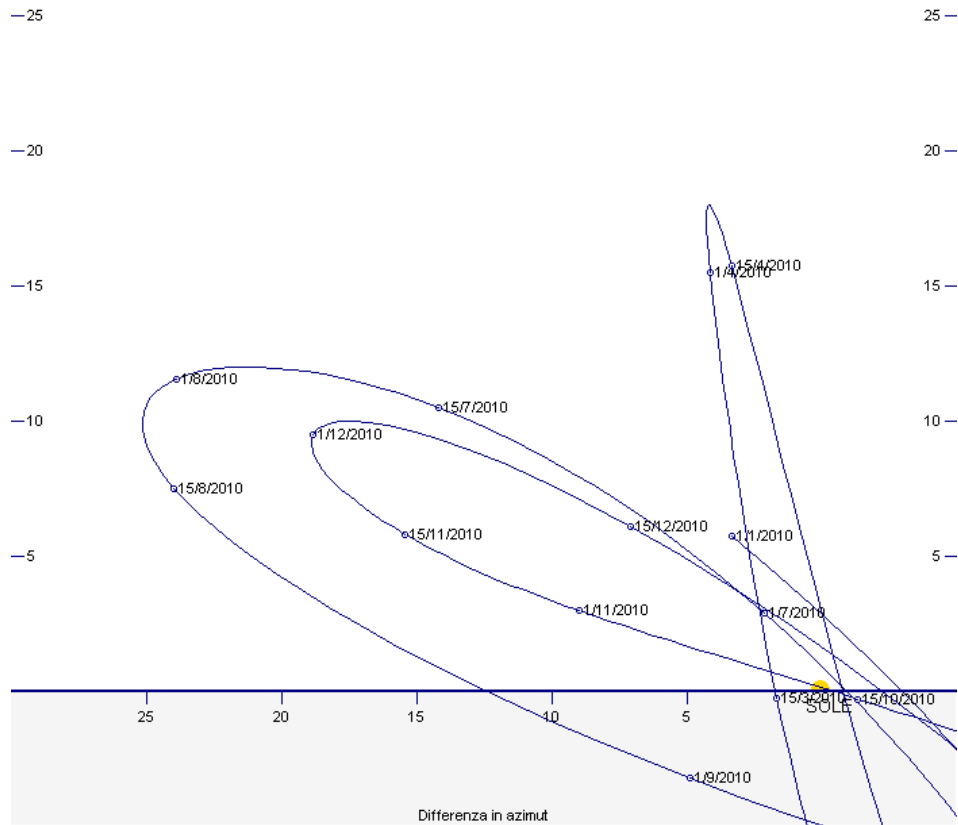
### Posizione di Mercurio al mattino rispetto al sorgere del Sole

Luogo : Roma  
 Latitudine: 42° 00' 00" N  
 Longitudine: 12° 00' 00" E



### Posizione di Mercurio alla sera rispetto al tramonto del Sole

Luogo : Roma  
 Latitudine: 42° 00' 00" N  
 Longitudine: 12° 00' 00" E



Posizione relativa di Mercurio rispetto al Sole al suo momento del sorgere e del tramonto

Relative position of Mercury respect to the sunrising and sunsetting

© (3)

# EFFEMERIDI DI VENERE - EPHEMERIDES OF VENUS

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle°	Rise	Transit	Set
01/01/2010	18h 34m 17.83s	-23° 38' 31.2"	0.7272434	1.7081077	14.21	2.6	9.8	-3.9	0.999	3.6	7.31	12.02	16.34
02/01/2010	18h 39m 47.38s	-23° 35' 57.3"	0.7273251	1.7085849	14.21	2.4	9.8	-3.9	0.999	3.3	7.32	12.04	16.36
03/01/2010	18h 45m 16.66s	-23° 32' 39.5"	0.7274037	1.7090243	14.21	2.2	9.8	-3.9	0.999	3.0	7.33	12.05	16.38
04/01/2010	18h 50m 45.62s	-23° 28' 37.9"	0.7274792	1.7094256	14.22	2.0	9.8	-3.9	0.999	2.7	7.35	12.07	16.39
05/01/2010	18h 56m 14.21s	-23° 23' 52.5"	0.7275514	1.7097887	14.22	1.8	9.8	-3.9	1.000	2.4	7.36	12.09	16.41
06/01/2010	19h 01m 42.36s	-23° 18' 23.7"	0.7276204	1.7101132	14.22	1.5	9.8	-3.9	1.000	2.1	7.37	12.10	16.43
07/01/2010	19h 07m 10.01s	-23° 12' 11.6"	0.7276860	1.7103989	14.22	1.3	9.8	-3.9	1.000	1.8	7.38	12.12	16.45
08/01/2010	19h 12m 37.12s	-23° 05' 16.5"	0.7277483	1.7106455	14.23	1.1	9.8	-3.9	1.000	1.6	7.39	12.13	16.47
09/01/2010	19h 18m 03.63s	-22° 57' 38.7"	0.7278071	1.7108527	14.23	1.0	9.8	-3.9	1.000	1.3	7.40	12.15	16.50
10/01/2010	19h 23m 29.49s	-22° 49' 18.5"	0.7278625	1.7110203	14.23	0.9	9.8	-3.9	1.000	1.2	7.41	12.16	16.52
11/01/2010	19h 28m 54.63s	-22° 40' 16.3"	0.7279144	1.7111480	14.23	0.8	9.8	-3.9	1.000	1.1	7.41	12.18	16.54
12/01/2010	19h 34m 19.01s	-22° 30' 32.3"	0.7279628	1.7112358	14.23	0.8	9.8	-3.9	1.000	1.1	7.42	12.19	16.56
13/01/2010	19h 39m 42.57s	-22° 20' 07.2"	0.7280076	1.7112834	14.23	0.9	9.8	-3.9	1.000	1.2	7.43	12.20	16.58
14/01/2010	19h 45m 05.27s	-22° 09' 01.2"	0.7280487	1.7112908	14.23	1.0	9.8	-3.9	1.000	1.3	7.43	12.22	17.01
15/01/2010	19h 50m 27.06s	-21° 57' 14.9"	0.7280863	1.7112579	14.23	1.2	9.8	-3.9	1.000	1.6	7.44	12.23	17.03
16/01/2010	19h 55m 47.89s	-21° 44' 48.9"	0.7281201	1.7111846	14.23	1.3	9.8	-3.9	1.000	1.8	7.44	12.25	17.05
17/01/2010	20h 01m 07.72s	-21° 31' 43.6"	0.7281503	1.7110710	14.23	1.5	9.8	-3.9	1.000	2.1	7.45	12.26	17.08
18/01/2010	20h 06m 26.52s	-21° 17' 59.5"	0.7281768	1.7109171	14.23	1.8	9.8	-3.9	1.000	2.4	7.45	12.27	17.10
19/01/2010	20h 11m 44.26s	-21° 03' 37.3"	0.7281995	1.7107229	14.23	2.0	9.8	-3.9	0.999	2.7	7.46	12.29	17.12
20/01/2010	20h 17m 00.89s	-20° 48' 37.4"	0.7282184	1.7104885	14.23	2.2	9.8	-3.9	0.999	3.0	7.46	12.30	17.15
21/01/2010	20h 22m 16.39s	-20° 33' 00.6"	0.7282336	1.7102141	14.22	2.4	9.8	-3.9	0.999	3.3	7.46	12.31	17.17
22/01/2010	20h 27m 30.74s	-20° 16' 47.4"	0.7282451	1.7098996	14.22	2.7	9.8	-3.9	0.999	3.6	7.46	12.33	17.20
23/01/2010	20h 32m 43.91s	-19° 59' 58.4"	0.7282527	1.7095454	14.22	2.9	9.8	-3.9	0.999	3.9	7.46	12.34	17.22
24/01/2010	20h 37m 55.88s	-19° 42' 34.4"	0.7282565	1.7091516	14.21	3.1	9.8	-3.9	0.999	4.2	7.46	12.35	17.25
25/01/2010	20h 43m 06.64s	-19° 24' 35.9"	0.7282566	1.7087183	14.21	3.4	9.8	-3.9	0.998	4.6	7.46	12.36	17.27
26/01/2010	20h 48m 16.17s	-19° 06' 03.8"	0.7282528	1.7082459	14.21	3.6	9.8	-3.9	0.998	4.9	7.46	12.38	17.30
27/01/2010	20h 53m 24.46s	-18° 46' 58.6"	0.7282453	1.7077345	14.20	3.8	9.8	-3.9	0.998	5.2	7.46	12.39	17.32
28/01/2010	20h 58m 31.50s	-18° 27' 21.1"	0.7282340	1.7071844	14.20	4.1	9.8	-3.9	0.998	5.5	7.46	12.40	17.35
29/01/2010	21h 03m 37.28s	-18° 07' 11.9"	0.7282189	1.7065957	14.19	4.3	9.8	-3.9	0.997	5.8	7.45	12.41	17.37
30/01/2010	21h 08m 41.79s	-17° 46' 31.9"	0.7282001	1.7059687	14.19	4.5	9.8	-3.9	0.997	6.1	7.45	12.42	17.40
31/01/2010	21h 13m 45.05s	-17° 25' 21.7"	0.7281775	1.7053032	14.18	4.8	9.8	-3.9	0.997	6.5	7.45	12.43	17.43
01/02/2010	21h 18m 47.04s	-17° 03' 42.0"	0.7281511	1.7045993	14.18	5.0	9.8	-3.9	0.996	6.8	7.44	12.44	17.45
02/02/2010	21h 23m 47.78s	-16° 41' 33.6"	0.7281211	1.7038567	14.17	5.2	9.8	-3.9	0.996	7.1	7.44	12.45	17.48
03/02/2010	21h 28m 47.28s	-16° 18' 57.1"	0.7280873	1.7030752	14.16	5.5	9.8	-3.9	0.996	7.4	7.43	12.47	17.50
04/02/2010	21h 33m 45.55s	-15° 55' 53.4"	0.7280499	1.7022543	14.16	5.7	9.8	-3.9	0.995	7.7	7.43	12.48	17.53
05/02/2010	21h 38m 42.60s	-15° 32' 23.1"	0.7280089	1.7013937	14.15	5.9	9.8	-3.9	0.995	8.1	7.42	12.49	17.55
06/02/2010	21h 43m 38.44s	-15° 08' 27.0"	0.7279642	1.7004929	14.14	6.2	9.8	-3.9	0.995	8.4	7.42	12.50	17.58
07/02/2010	21h 48m 33.09s	-14° 44' 05.9"	0.7279160	1.6995515	14.13	6.4	9.8	-3.9	0.994	8.7	7.41	12.50	18.01
08/02/2010	21h 53m 26.57s	-14° 19' 20.6"	0.7278643	1.6985692	14.13	6.7	9.8	-3.9	0.994	9.0	7.40	12.51	18.03
09/02/2010	21h 58m 18.88s	-13° 54' 11.9"	0.7278090	1.6975456	14.12	6.9	9.8	-3.9	0.993	9.4	7.40	12.52	18.06
10/02/2010	22h 03m 10.04s	-13° 28' 40.6"	0.7277503	1.6964804	14.11	7.1	9.8	-3.9	0.993	9.7	7.39	12.53	18.08
11/02/2010	22h 08m 00.09s	-13° 02' 47.4"	0.7276882	1.6953732	14.10	7.4	9.8	-3.9	0.992	10.0	7.38	12.54	18.11
12/02/2010	22h 12m 49.02s	-12° 36' 33.2"	0.7276228	1.6942237	14.09	7.6	9.9	-3.9	0.992	10.3	7.37	12.55	18.13
13/02/2010	22h 17m 36.88s	-12° 09' 58.6"	0.7275540	1.6930318	14.08	7.8	9.9	-3.9	0.991	10.7	7.37	12.56	18.16
14/02/2010	22h 22m 23.67s	-11° 43' 04.6"	0.7274819	1.6917970	14.07	8.1	9.9	-3.9	0.991	11.0	7.36	12.57	18.18
15/02/2010	22h 27m 09.44s	-11° 15' 51.9"	0.7274067	1.6905194	14.06	8.3	9.9	-3.9	0.990	11.3	7.35	12.57	18.21
16/02/2010	22h 31m 54.20s	-10° 48' 21.3"	0.7273283	1.6891985	14.05	8.6	9.9	-3.9	0.990	11.7	7.34	12.58	18.23
17/02/2010	22h 36m 37.99s	-10° 20' 33.6"	0.7272468	1.6878344	14.04	8.8	9.9	-3.9	0.989	12.0	7.33	12.59	18.26
18/02/2010	22h 41m 20.83s	-09° 52' 29.5"	0.7271622	1.6864269	14.03	9.0	9.9	-3.9	0.988	12.3	7.32	13.00	18.28
19/02/2010	22h 46m 02.76s	-09° 24' 09.8"	0.7270747	1.6849758	14.01	9.3	9.9	-3.9	0.988	12.7	7.31	13.01	18.31
20/02/2010	22h 50m 43.81s	-08° 55' 35.3"	0.7269843	1.6834813	14.00	9.5	9.9	-3.9	0.987	13.0	7.30	13.01	18.33
21/02/2010	22h 55m 24.01s	-08° 26' 46.8"	0.7268911	1.6819432	13.99	9.8	9.9	-3.9	0.987	13.3	7.29	13.02	18.36
22/02/2010	23h 00m 03.40s	-07° 57' 45.1"	0.7267951	1.6803616	13.98	10.0	9.9	-3.9	0.986	13.7	7.28	13.03	18.38
23/02/2010	23h 04m 42.02s	-07° 28' 30.9"	0.7266965	1.6787365	13.96	10.2	9.9	-3.9	0.985	14.0	7.27	13.03	18.41
24/02/2010	23h 09m 19.89s	-06° 59' 04.9"	0.7265952	1.6770681	13.95	10.5	10.0	-3.9	0.984	14.3	7.26	13.04	18.43
25/02/2010	23h 13m 57.06s	-06° 29' 28.1"	0.7264913	1.6753564	13.93	10.7	10.0	-3.9	0.984	14.7	7.24	13.05	18.46
26/02/2010	23h 18m 33.55s	-05° 59' 41.0"	0.7263851	1.6736017	13.92	11.0	10.0	-3.9	0.983	15.0	7.23	13.05	18.48
27/02/2010	23h 23m 09.42s	-05° 29' 44.5"	0.7262764	1.6718041	13.90	11.2	10.0	-3.9	0.982	15.3	7.22	13.06	18.51
28/02/2010	23h 27m 44.70s	-04° 59' 39.4"	0.7261654	1.6699635	13.89	11.4	10.0	-3.9	0.981	15.7	7.21	13.07	18.53
01/03/2010	23h 32m 19.43s	-04° 29' 26.2"	0.7260523	1.6680801	13.87	11.7	10.0	-3.9	0.981	16.0	7.20	13.07	18.56
02/03/2010	23h 36m 53.65s	-03° 59' 05.9"	0.7259370	1.6661536	13.86	11.9	10.0	-3.9	0.980	16.4	7.19	13.08	18.58
03/03/2010	23h 41m 27.43s	-03° 28' 38.9"	0.7258196	1.6641839	13.84	12.2	10.0	-3.9	0.979	16.7	7.17	13.09	19.01
04/03/2010	23h 46m 00.79s	-02° 58' 06.2"	0.7257004	1.6621706	13.82	12.4	10.0	-3.9	0.978	17.1	7.16	13.09	19.03
05/03/2010	23h 50m 33.79s	-02° 27' 28.4"	0.7255792	1.6601133	13.81	12.6	10.1	-3.9	0.977	17.4	7.15	13.10	19.06
06/03/2010	23h 55m 06.46s	-01° 56' 46.1"	0.7254563	1.6580116	13.79	12.9	10.1	-3.9	0.976	17.7	7.14	13.10	19.08
07/03/2010	23h 59m 38.86s	-01° 26' 00.3"	0.7253318	1.6558651	13.77	13.1	10.1	-3.9	0.975	18.1	7.12	13.11	19.10
08/03/2010	00h 04m 11.02s	-00° 55' 11.7"	0.7252056	1.6536732	13.75	13.4	10.1	-3.9	0.974	18.4	7.11	13.12	19.13
09/03/2010	00h 08m 42.98s	-00° 24' 20.8"	0.7250780	1.6514355	13.74	13.6	10.1	-3.9	0.973	18.8	7.10	13.12	19.15
10/03/2010	00h 13m 14.79s	+00° 06' 31.4"	0.7249490	1.6491516	13.72	13.8	10.1	-3.9	0.972	19.1	7.09	13.13	19.18
11/03/2010	00h 17m 46.49s	+00° 37' 24.2"	0.7248187	1.6468210	13.70	14.1	10.1	-3.9	0.971	19.5	7.07	13.13	19.20
12/03/2010	00h 22m 18.12s	+01° 08' 16.9"	0.7246873	1.6444434	13.68	14.3	10.1	-3.9	0.970	19.8	7.06	13.14	19.23
13/03/2010	00h 26m 49.71s	+01° 39' 08.8"	0.7245547	1.6420182	13.66	14.6	10.2	-3.9	0.969	20.2	7.05	13.15	19.25
14/03/2010	00h 31m 21.33s	+02° 09' 59.0"	0.7244212	1.6395453	13.64	14.8	10.2	-3.9	0.968	20.5	7.04	13.15	19.28
15/03/2010	00h 35m 52.99s	+02° 40' 46.9"	0.7242										

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle°	Rise	Transit	Set
09/04/2010	02h 31m 16.52s	+14° 41' 53.3"	0.7209526	1.5580018	12.96	21.1	10.7	-3.9	0.933	30.1	6.34	13.33	20.32
10/04/2010	02h 36m 02.89s	+15° 07' 20.3"	0.7208326	1.5541933	12.93	21.4	10.7	-3.9	0.931	30.4	6.34	13.34	20.34
11/04/2010	02h 40m 50.24s	+15° 32' 24.9"	0.7207145	1.5503330	12.89	21.6	10.8	-3.9	0.929	30.8	6.33	13.34	20.37
12/04/2010	02h 45m 38.59s	+15° 57' 06.3"	0.7205985	1.5464207	12.86	21.9	10.8	-3.9	0.928	31.2	6.32	13.35	20.40
13/04/2010	02h 50m 27.96s	+16° 21' 23.9"	0.7204846	1.5424560	12.83	22.1	10.8	-3.9	0.926	31.6	6.31	13.36	20.42
14/04/2010	02h 55m 18.37s	+16° 45' 16.9"	0.7203729	1.5384387	12.80	22.4	10.8	-3.9	0.924	32.0	6.30	13.37	20.45
15/04/2010	03h 00m 09.83s	+17° 08' 44.4"	0.7202635	1.5343686	12.76	22.6	10.9	-3.9	0.922	32.4	6.30	13.38	20.47
16/04/2010	03h 05m 02.33s	+17° 31' 45.9"	0.7201566	1.5302456	12.73	22.9	10.9	-3.9	0.920	32.8	6.29	13.39	20.50
17/04/2010	03h 09m 55.90s	+17° 54' 20.6"	0.7200521	1.5260695	12.69	23.1	10.9	-3.9	0.919	33.2	6.29	13.40	20.52
18/04/2010	03h 14m 50.54s	+18° 16' 27.6"	0.7199502	1.5218402	12.66	23.3	11.0	-3.9	0.917	33.5	6.28	13.41	20.55
19/04/2010	03h 19m 46.24s	+18° 38' 06.4"	0.7198509	1.5175578	12.62	23.6	11.0	-3.9	0.915	33.9	6.27	13.42	20.57
20/04/2010	03h 24m 43.00s	+18° 59' 16.2"	0.7197543	1.5132224	12.59	23.8	11.0	-3.9	0.913	34.3	6.27	13.43	21.00
21/04/2010	03h 29m 40.82s	+19° 19' 56.3"	0.7196606	1.5088341	12.55	24.1	11.1	-3.9	0.911	34.7	6.26	13.44	21.02
22/04/2010	03h 34m 39.68s	+19° 40' 06.0"	0.7195698	1.5043932	12.51	24.3	11.1	-3.9	0.909	35.1	6.26	13.45	21.05
23/04/2010	03h 39m 39.59s	+19° 59' 44.6"	0.7194819	1.4999000	12.48	24.6	11.1	-3.9	0.907	35.5	6.26	13.46	21.07
24/04/2010	03h 44m 40.53s	+20° 18' 51.4"	0.7193970	1.4953548	12.44	24.8	11.2	-3.9	0.905	35.9	6.25	13.47	21.10
25/04/2010	03h 49m 42.50s	+20° 37' 25.7"	0.7193152	1.4907580	12.40	25.1	11.2	-3.9	0.903	36.3	6.25	13.48	21.12
26/04/2010	03h 54m 45.47s	+20° 55' 26.9"	0.7192366	1.4861100	12.36	25.3	11.2	-3.9	0.901	36.7	6.25	13.49	21.14
27/04/2010	03h 59m 49.45s	+21° 12' 54.4"	0.7191612	1.4814111	12.32	25.5	11.3	-3.9	0.899	37.1	6.25	13.50	21.17
28/04/2010	04h 04m 54.40s	+21° 29' 47.6"	0.7190891	1.4766618	12.28	25.8	11.3	-3.9	0.897	37.5	6.25	13.52	21.19
29/04/2010	04h 10m 00.33s	+21° 46' 05.8"	0.7190204	1.4718622	12.24	26.0	11.3	-3.9	0.894	37.9	6.25	13.53	21.22
30/04/2010	04h 15m 07.19s	+22° 01' 48.6"	0.7189550	1.4670127	12.20	26.3	11.4	-3.9	0.892	38.3	6.25	13.54	21.24
01/05/2010	04h 20m 14.98s	+22° 16' 55.2"	0.7188931	1.4621132	12.16	26.5	11.4	-3.9	0.890	38.7	6.25	13.55	21.26
02/05/2010	04h 25m 23.66s	+22° 31' 25.2"	0.7188348	1.4571640	12.12	26.8	11.5	-3.9	0.888	39.2	6.25	13.56	21.29
03/05/2010	04h 30m 33.21s	+22° 45' 18.1"	0.7187799	1.4521650	12.08	27.0	11.5	-3.9	0.885	39.6	6.25	13.58	21.31
04/05/2010	04h 35m 43.58s	+22° 58' 33.2"	0.7187287	1.4471163	12.04	27.3	11.5	-3.9	0.883	40.0	6.25	13.59	21.33
05/05/2010	04h 40m 54.74s	+23° 11' 10.1"	0.7186811	1.4420178	11.99	27.5	11.6	-3.9	0.881	40.4	6.26	14.00	21.35
06/05/2010	04h 46m 06.66s	+23° 23' 08.2"	0.7186371	1.4368696	11.95	27.7	11.6	-3.9	0.879	40.8	6.26	14.01	21.37
07/05/2010	04h 51m 19.29s	+23° 34' 27.1"	0.7185969	1.4316716	11.91	28.0	11.7	-3.9	0.876	41.2	6.26	14.03	21.39
08/05/2010	04h 56m 32.60s	+23° 45' 06.5"	0.7185605	1.4264238	11.86	28.2	11.7	-3.9	0.874	41.6	6.27	14.04	21.42
09/05/2010	05h 01m 46.53s	+23° 55' 05.7"	0.7185278	1.4211262	11.82	28.5	11.7	-3.9	0.871	42.0	6.27	14.05	21.44
10/05/2010	05h 07m 01.04s	+24° 04' 24.5"	0.7184989	1.4157787	11.78	28.7	11.8	-3.9	0.869	42.4	6.28	14.06	21.46
11/05/2010	05h 12m 16.08s	+24° 13' 02.4"	0.7184738	1.4103813	11.73	28.9	11.8	-3.9	0.866	42.9	6.28	14.08	21.48
12/05/2010	05h 17m 31.60s	+24° 20' 59.2"	0.7184526	1.4049341	11.69	29.2	11.9	-3.9	0.864	43.3	6.29	14.09	21.49
13/05/2010	05h 22m 47.53s	+24° 28' 14.6"	0.7184353	1.3994369	11.64	29.4	11.9	-3.9	0.861	43.7	6.30	14.10	21.51
14/05/2010	05h 28m 03.84s	+24° 34' 48.1"	0.7184218	1.3938899	11.59	29.7	12.0	-3.9	0.859	44.1	6.31	14.12	21.53
15/05/2010	05h 33m 20.45s	+24° 40' 39.8"	0.7184122	1.3882930	11.55	29.9	12.0	-3.9	0.856	44.5	6.32	14.13	21.55
16/05/2010	05h 38m 37.30s	+24° 45' 49.2"	0.7184065	1.3826465	11.50	30.1	12.1	-4	0.854	45.0	6.33	14.14	21.57
17/05/2010	05h 43m 54.32s	+24° 50' 16.2"	0.7184048	1.3769504	11.45	30.4	12.1	-4	0.851	45.4	6.34	14.16	21.58
18/05/2010	05h 49m 11.45s	+24° 54' 00.7"	0.7184069	1.3712051	11.40	30.6	12.2	-4	0.849	45.8	6.35	14.17	22.00
19/05/2010	05h 54m 28.63s	+24° 57' 02.6"	0.7184129	1.3654108	11.36	30.9	12.2	-4	0.846	46.2	6.36	14.18	22.01
20/05/2010	05h 59m 45.77s	+24° 59' 21.7"	0.7184228	1.3595681	11.31	31.1	12.3	-4	0.843	46.7	6.37	14.20	22.03
21/05/2010	06h 05m 02.81s	+25° 00' 58.0"	0.7184367	1.3536775	11.26	31.3	12.3	-4	0.840	47.1	6.38	14.21	22.04
22/05/2010	06h 10m 19.69s	+25° 01' 51.5"	0.7184544	1.3477395	11.21	31.6	12.4	-4	0.838	47.5	6.39	14.23	22.06
23/05/2010	06h 15m 36.34s	+25° 02' 02.1"	0.7184759	1.3417548	11.16	31.8	12.4	-4	0.835	47.9	6.41	14.24	22.07
24/05/2010	06h 20m 52.70s	+25° 01' 30.0"	0.7185013	1.3357241	11.11	32.0	12.5	-4	0.832	48.4	6.42	14.25	22.08
25/05/2010	06h 26m 08.70s	+25° 00' 15.1"	0.7185306	1.3296480	11.06	32.3	12.5	-4	0.829	48.8	6.44	14.26	22.09
26/05/2010	06h 31m 24.28s	+24° 58' 17.6"	0.7185636	1.3235273	11.01	32.5	12.6	-4	0.826	49.2	6.45	14.28	22.10
27/05/2010	06h 36m 39.38s	+24° 55' 37.7"	0.7186004	1.3173626	10.96	32.7	12.7	-4	0.824	49.7	6.47	14.29	22.12
28/05/2010	06h 41m 53.94s	+24° 52' 15.4"	0.7186410	1.3111544	10.91	33.0	12.7	-4	0.821	50.1	6.48	14.30	22.12
29/05/2010	06h 47m 07.89s	+24° 48' 11.1"	0.7186853	1.3049034	10.85	33.2	12.8	-4	0.818	50.5	6.50	14.32	22.13
30/05/2010	06h 52m 21.18s	+24° 43' 24.9"	0.7187332	1.2986099	10.80	33.4	12.8	-4	0.815	51.0	6.51	14.33	22.14
31/05/2010	06h 57m 33.74s	+24° 37' 57.0"	0.7187848	1.2922746	10.75	33.7	12.9	-4	0.812	51.4	6.53	14.34	22.15
01/06/2010	07h 02m 45.52s	+24° 31' 47.8"	0.7188400	1.2858978	10.70	33.9	13.0	-4	0.809	51.8	6.55	14.35	22.16
02/06/2010	07h 07m 56.46s	+24° 24' 57.5"	0.7188988	1.2794799	10.64	34.1	13.0	-4	0.806	52.3	6.57	14.37	22.16
03/06/2010	07h 13m 06.51s	+24° 17' 26.5"	0.7189610	1.2730211	10.59	34.3	13.1	-4	0.803	52.7	6.59	14.38	22.17
04/06/2010	07h 18m 15.61s	+24° 09' 15.0"	0.7190267	1.2665220	10.53	34.6	13.2	-4	0.800	53.2	7.00	14.39	22.17
05/06/2010	07h 23m 23.72s	+24° 00' 23.5"	0.7190958	1.2599827	10.48	34.8	13.2	-4	0.797	53.6	7.02	14.40	22.18
06/06/2010	07h 28m 30.78s	+23° 50' 52.4"	0.7191683	1.2534035	10.43	35.0	13.3	-4	0.794	54.0	7.04	14.41	22.18
07/06/2010	07h 33m 36.75s	+23° 40' 42.1"	0.7192440	1.2467848	10.37	35.2	13.4	-4	0.790	54.5	7.06	14.43	22.18
08/06/2010	07h 38m 41.59s	+23° 29' 53.1"	0.7193230	1.2401268	10.31	35.5	13.5	-4	0.787	54.9	7.08	14.44	22.19
09/06/2010	07h 43m 45.24s	+23° 18' 25.8"	0.7194051	1.2334297	10.26	35.7	13.5	-4	0.784	55.4	7.10	14.45	22.19
10/06/2010	07h 48m 47.68s	+23° 06' 20.7"	0.7194903	1.2266938	10.20	35.9	13.6	-4	0.781	55.8	7.12	14.46	22.19
11/06/2010	07h 53m 48.86s	+22° 53' 38.4"	0.7195786	1.2199192	10.15	36.1	13.7	-4	0.778	56.3	7.14	14.47	22.19
12/06/2010	07h 58m 48.73s	+22° 40' 19.4"	0.7196698	1.2131063	10.09	36.3	13.8	-4	0.774	56.7	7.16	14.48	22.19
13/06/2010	08h 03m 47.27s	+22° 26' 24.4"	0.7197639	1.2062552	10.03	36.5	13.8	-4	0.771	57.2	7.19	14.49	22.19
14/06/2010	08h 08m 44.43s	+22° 11' 53.8"	0.7198608	1.1993663	9.98	36.8	13.9	-4	0.768	57.6	7.21	14.50	22.19
15/06/2010	08h 13m 40.18s	+21° 56' 48.4"	0.7199604	1.1924398	9.92	37.0	14.0	-4	0.765	58.1	7.23	14.51	22.19
16/06/2010	08h 18m 34.48s	+21° 41' 08.7"	0.7200627	1.1854764	9.86	37.2	14.1	-4	0.761	58.5	7.25	14.52	22.18
17/06/2010	08h 23m 27.30s	+21° 24' 55.3"	0.7201675	1.1784765	9.80	37.4	14.2	-4	0.758	59.0	7.27	14.53	22.18
18/06/2010	08h 28m 18.61s	+21° 08' 09.0"	0.7202748	1.1714407	9.74	37.6	14.2	-4	0.754	59.4	7.29	14.54	22.18
19/06/2010	08h 33m 08.39s	+20° 50' 50.4"	0.7203845	1.1643698	9.68	37.8	14.3	-4	0.751	59.9	7.31	14.55	22.17
20/06/2010	08h 37m 56.62s	+20° 33' 00.1"	0.7204965	1.1572647	9.63	38.0	14.4	-4	0.748	60.3	7.34	14.56	22.17
21/06/2010	08h 42m 43.28s	+20° 14' 38											

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle°	Rise	Transit	Set
22/07/2010	10h 57m 50.31s	+07° 32' 49.3"	0.7247057	0.9159468	7.62	43.7	18.2	-4.1	0.625	75.5	8.39	15.09	21.38
23/07/2010	11h 01m 48.32s	+07° 04' 05.2"	0.7248371	0.9080722	7.55	43.8	18.4	-4.1	0.621	76.0	8.41	15.09	21.36
24/07/2010	11h 05m 45.00s	+06° 35' 13.2"	0.7249674	0.9001852	7.49	43.9	18.5	-4.1	0.616	76.5	8.43	15.09	21.34
25/07/2010	11h 09m 40.37s	+06° 06' 13.9"	0.7250963	0.8922865	7.42	44.1	18.7	-4.2	0.612	77.0	8.44	15.09	21.32
26/07/2010	11h 13m 34.44s	+05° 37' 07.9"	0.7252238	0.8843770	7.36	44.2	18.9	-4.2	0.608	77.6	8.46	15.09	21.30
27/07/2010	11h 17m 27.24s	+05° 07' 55.9"	0.7253498	0.8764577	7.29	44.3	19.0	-4.2	0.603	78.1	8.48	15.09	21.29
28/07/2010	11h 21m 18.77s	+04° 38' 38.4"	0.7254742	0.8685292	7.22	44.4	19.2	-4.2	0.599	78.6	8.49	15.09	21.27
29/07/2010	11h 25m 09.05s	+04° 09' 16.2"	0.7255969	0.8605924	7.16	44.6	19.4	-4.2	0.595	79.1	8.51	15.08	21.25
30/07/2010	11h 28m 58.10s	+03° 39' 49.8"	0.7257179	0.8526479	7.09	44.7	19.6	-4.2	0.590	79.6	8.53	15.08	21.23
31/07/2010	11h 32m 45.94s	+03° 10' 19.8"	0.7258369	0.8446965	7.03	44.8	19.8	-4.2	0.586	80.1	8.54	15.08	21.21
01/08/2010	11h 36m 32.58s	+02° 40' 46.9"	0.7259540	0.8367388	6.96	44.9	19.9	-4.2	0.581	80.7	8.56	15.08	21.19
02/08/2010	11h 40m 18.03s	+02° 11' 11.6"	0.7260690	0.8287756	6.89	45.0	20.1	-4.2	0.576	81.2	8.57	15.08	21.17
03/08/2010	11h 44m 02.30s	+01° 41' 34.5"	0.7261819	0.8208073	6.83	45.1	20.3	-4.2	0.572	81.7	8.59	15.08	21.15
04/08/2010	11h 47m 45.41s	+01° 11' 56.3"	0.7262925	0.8128346	6.76	45.2	20.5	-4.2	0.567	82.3	9.01	15.07	21.13
05/08/2010	11h 51m 27.37s	+00° 42' 17.5"	0.7264008	0.8048579	6.69	45.3	20.7	-4.2	0.563	82.8	9.02	15.07	21.11
06/08/2010	11h 55m 08.19s	+00° 12' 38.7"	0.7265067	0.7968778	6.63	45.4	20.9	-4.2	0.558	83.4	9.04	15.07	21.09
07/08/2010	11h 58m 47.86s	-00° 16' 59.4"	0.7266101	0.7888947	6.56	45.4	21.1	-4.2	0.553	83.9	9.05	15.06	21.07
08/08/2010	12h 02m 26.40s	-00° 46' 36.2"	0.7267110	0.7809089	6.50	45.5	21.4	-4.2	0.548	84.5	9.07	15.06	21.05
09/08/2010	12h 06m 03.80s	-01° 16' 11.1"	0.7268092	0.7729209	6.43	45.6	21.6	-4.2	0.543	85.0	9.08	15.06	21.03
10/08/2010	12h 09m 40.05s	-01° 45' 43.4"	0.7269047	0.7649310	6.36	45.6	21.8	-4.3	0.539	85.6	9.09	15.05	21.01
11/08/2010	12h 13m 15.15s	-02° 15' 12.5"	0.7269974	0.7569396	6.30	45.7	22.0	-4.3	0.534	86.1	9.11	15.05	20.99
12/08/2010	12h 16m 49.09s	-02° 44' 37.7"	0.7270873	0.7489472	6.23	45.7	22.3	-4.3	0.529	86.7	9.12	15.05	20.96
13/08/2010	12h 20m 21.87s	-03° 13' 58.4"	0.7271742	0.7409544	6.16	45.8	22.5	-4.3	0.524	87.3	9.14	15.04	20.94
14/08/2010	12h 23m 53.45s	-03° 43' 14.0"	0.7272581	0.7329619	6.10	45.8	22.8	-4.3	0.519	87.9	9.15	15.04	20.92
15/08/2010	12h 27m 23.84s	-04° 12' 23.8"	0.7273390	0.7249705	6.03	45.9	23.0	-4.3	0.514	88.4	9.16	15.03	20.90
16/08/2010	12h 30m 53.00s	-04° 41' 27.1"	0.7274168	0.7169813	5.96	45.9	23.3	-4.3	0.508	89.0	9.18	15.03	20.88
17/08/2010	12h 34m 20.92s	-05° 10' 23.3"	0.7274914	0.7089952	5.90	45.9	23.5	-4.3	0.503	89.6	9.19	15.02	20.85
18/08/2010	12h 37m 47.57s	-05° 39' 11.8"	0.7275627	0.7010132	5.83	45.9	23.8	-4.3	0.498	90.2	9.20	15.02	20.83
19/08/2010	12h 41m 12.92s	-06° 07' 51.9"	0.7276308	0.6930366	5.76	46.0	24.1	-4.3	0.493	90.8	9.21	15.01	20.41
20/08/2010	12h 44m 36.94s	-06° 36' 23.1"	0.7276955	0.6850665	5.70	46.0	24.4	-4.3	0.487	91.4	9.22	15.01	20.39
21/08/2010	12h 47m 59.61s	-07° 04' 44.6"	0.7277569	0.6771040	5.63	46.0	24.6	-4.3	0.482	92.1	9.24	15.00	20.36
22/08/2010	12h 51m 20.88s	-07° 32' 55.9"	0.7278148	0.6691503	5.57	46.0	24.9	-4.3	0.477	92.7	9.25	15.00	20.34
23/08/2010	12h 54m 40.73s	-08° 00' 56.2"	0.7278693	0.6612067	5.50	45.9	25.2	-4.3	0.471	93.3	9.26	14.59	20.32
24/08/2010	12h 57m 59.11s	-08° 28' 45.1"	0.7279202	0.6532743	5.43	45.9	25.5	-4.3	0.465	94.0	9.27	14.58	20.29
25/08/2010	13h 01m 15.98s	-08° 56' 21.9"	0.7279676	0.6453543	5.37	45.9	25.9	-4.4	0.460	94.6	9.28	14.58	20.27
26/08/2010	13h 04m 31.30s	-09° 23' 46.0"	0.7280114	0.6374479	5.30	45.8	26.2	-4.4	0.454	95.3	9.29	14.57	20.25
27/08/2010	13h 07m 45.02s	-09° 50' 56.8"	0.7280516	0.6295565	5.24	45.8	26.5	-4.4	0.448	95.9	9.30	14.56	20.22
28/08/2010	13h 10m 57.09s	-10° 17' 53.6"	0.7280881	0.6216811	5.17	45.7	26.8	-4.4	0.443	96.6	9.31	14.56	20.20
29/08/2010	13h 14m 07.46s	-10° 44' 35.9"	0.7281210	0.6138231	5.11	45.7	27.2	-4.4	0.437	97.3	9.32	14.55	20.17
30/08/2010	13h 17m 16.07s	-11° 11' 02.9"	0.7281501	0.6059836	5.04	45.6	27.5	-4.4	0.431	98.0	9.32	14.54	20.15
31/08/2010	13h 20m 22.85s	-11° 37' 14.2"	0.7281756	0.5981640	4.98	45.5	27.9	-4.4	0.425	98.7	9.33	14.53	20.12
01/09/2010	13h 23m 27.74s	-12° 03' 09.1"	0.7281973	0.5903653	4.91	45.4	28.3	-4.4	0.419	99.4	9.34	14.52	20.10
02/09/2010	13h 26m 30.67s	-12° 28' 46.8"	0.7282152	0.5825889	4.85	45.3	28.6	-4.4	0.412	100.1	9.35	14.51	20.07
03/09/2010	13h 29m 31.54s	-12° 54' 06.9"	0.7282293	0.5748360	4.78	45.2	29.0	-4.4	0.406	100.8	9.35	14.50	20.05
04/09/2010	13h 32m 30.28s	-13° 19' 08.5"	0.7282397	0.5671076	4.72	45.0	29.4	-4.4	0.400	101.5	9.36	14.49	20.02
05/09/2010	13h 35m 26.80s	-13° 43' 51.0"	0.7282463	0.5594052	4.65	44.9	29.8	-4.5	0.394	102.3	9.37	14.48	19.99
06/09/2010	13h 38m 20.99s	-14° 08' 13.7"	0.7282491	0.5517298	4.59	44.7	30.2	-4.5	0.387	103.1	9.37	14.47	19.97
07/09/2010	13h 41m 12.75s	-14° 32' 15.8"	0.7282481	0.5440826	4.53	44.6	30.7	-4.5	0.381	103.8	9.38	14.46	19.94
08/09/2010	13h 44m 01.95s	-14° 55' 56.5"	0.7282433	0.5364650	4.46	44.4	31.1	-4.5	0.374	104.6	9.38	14.45	19.92
09/09/2010	13h 46m 48.48s	-15° 19' 15.2"	0.7282348	0.5288783	4.40	44.2	31.5	-4.5	0.367	105.4	9.38	14.44	19.49
10/09/2010	13h 49m 32.19s	-15° 42' 10.9"	0.7282224	0.5213242	4.34	44.0	32.0	-4.5	0.360	106.2	9.39	14.43	19.46
11/09/2010	13h 52m 12.95s	-16° 04' 42.8"	0.7282063	0.5138043	4.27	43.7	32.5	-4.5	0.353	107.0	9.39	14.41	19.43
12/09/2010	13h 54m 50.59s	-16° 26' 50.1"	0.7281864	0.5063206	4.21	43.5	32.9	-4.5	0.346	107.9	9.39	14.40	19.40
13/09/2010	13h 57m 24.96s	-16° 48' 31.9"	0.7281628	0.4988754	4.15	43.3	33.4	-4.5	0.339	108.7	9.39	14.39	19.38
14/09/2010	13h 59m 55.88s	-17° 09' 47.2"	0.7281354	0.4914708	4.09	43.0	33.9	-4.5	0.332	109.6	9.39	14.37	19.35
15/09/2010	14h 02m 23.17s	-17° 30' 35.1"	0.7281044	0.4841096	4.03	42.7	34.5	-4.5	0.325	110.5	9.39	14.36	19.32
16/09/2010	14h 04m 46.65s	-17° 50' 54.7"	0.7280696	0.4767943	3.97	42.4	35.0	-4.5	0.317	111.4	9.39	14.34	19.29
17/09/2010	14h 07m 06.12s	-18° 10' 44.9"	0.7280312	0.4695279	3.91	42.1	35.5	-4.5	0.310	112.4	9.38	14.32	19.26
18/09/2010	14h 09m 21.38s	-18° 30' 04.6"	0.7279892	0.4623133	3.85	41.7	36.1	-4.5	0.302	113.3	9.38	14.31	19.23
19/09/2010	14h 11m 32.22s	-18° 48' 52.9"	0.7279436	0.4551537	3.79	41.3	36.7	-4.5	0.295	114.3	9.37	14.29	19.20
20/09/2010	14h 13m 38.44s	-19° 07' 08.5"	0.7278945	0.4480523	3.73	41.0	37.2	-4.5	0.287	115.3	9.37	14.27	19.17
21/09/2010	14h 15m 39.80s	-19° 24' 50.4"	0.7278418	0.4410125	3.67	40.5	37.8	-4.5	0.279	116.3	9.36	14.25	19.13
22/09/2010	14h 17m 36.09s	-19° 41' 57.2"	0.7277856	0.4340381	3.61	40.1	38.4	-4.5	0.271	117.3	9.35	14.23	19.10
23/09/2010	14h 19m 27.08s	-19° 58' 27.7"	0.7277260	0.4271327	3.55	39.7	39.1	-4.6	0.263	118.3	9.34	14.21	19.07
24/09/2010	14h 21m 12.53s	-20° 14' 20.6"	0.7276631	0.4203002	3.50	39.2	39.7	-4.6	0.254	119.4	9.33	14.19	19.04
25/09/2010	14h 22m 52.19s	-20° 29' 34.4"	0.7275967	0.4135448	3.44	38.7	40.3	-4.6	0.246	120.5	9.32	14.16	19.00
26/09/2010	14h 24m 25.82s	-20° 44' 07.7"	0.7275271	0.4068707	3.38	38.1	41.0	-4.6	0.238	121.6	9.31	14.14	18.97
27/09/2010	14h 25m 53.19s	-20° 57' 59.0"	0.7274543	0.4002822	3.33	37.6	41.7	-4.6	0.229	122.8	9.29	14.11	18.93
28/09/2010	14h 27m 14.03s	-21° 11' 06.6"	0.7273782	0.3937841	3.28	37.0	42.4	-4.6	0.221	124.0	9.27	14.09	18.90
29/09/2010	14h 28m 28.10s	-21° 23' 28.8"	0.7272991	0.3873811	3.22	36.4	43.1	-4.6	0.212	125.2	9.25	14.06	18.86
30/09/2010	14h 29m 35.14s	-21° 35' 03.8"	0.7272168	0.3810781	3.17	35.7	43.8	-4.6	0.203	126.4	9.23	14.03	18.82
01/10/2010	14h 30m 34.92s	-21° 45' 49.6"	0.7271316	0.3748803	3.12	35.1	44.5	-4.6	0.194	127.7	9.21	14.00	18.78
02/10/2010	14h 31m 27.18s	-21° 55' 44.4"	0.7270435	0.3687929	3.07	34.4	45.2	-4.6	0.185	129.0	9.19	13.97	18.35
03/10/2													



Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle°	Rise	Transit	Set
03/11/2010	13h 54m 23.20s	-16° 59' 23.6"	0.7231629	0.2739623	2.28	9.3	60.9	-4.1	0.013	167.2	6.14	11.13	16.12
04/11/2010	13h 52m 34.73s	-16° 34' 33.0"	0.7230263	0.2752963	2.29	10.6	60.6	-4.2	0.016	165.4	6.07	11.07	16.08
05/11/2010	13h 50m 52.40s	-16° 09' 48.8"	0.7228898	0.2769099	2.30	11.9	60.2	-4.2	0.020	163.6	5.59	11.02	16.04
06/11/2010	13h 49m 16.78s	-15° 45' 18.9"	0.7227538	0.2787980	2.32	13.2	59.8	-4.2	0.025	161.8	5.52	10.56	16.01
07/11/2010	13h 47m 48.41s	-15° 21' 11.2"	0.7226181	0.2809548	2.34	14.5	59.4	-4.3	0.031	159.9	5.45	10.51	15.57
08/11/2010	13h 46m 27.73s	-14° 57' 32.7"	0.7224831	0.2833738	2.36	15.9	58.9	-4.3	0.036	158.0	5.39	10.46	15.53
09/11/2010	13h 45m 15.13s	-14° 34' 30.2"	0.7223486	0.2860485	2.38	17.2	58.3	-4.3	0.043	156.1	5.32	10.40	15.50
10/11/2010	13h 44m 10.92s	-14° 12' 09.8"	0.7222150	0.2889718	2.40	18.5	57.7	-4.4	0.050	154.2	5.26	10.36	15.46
11/11/2010	13h 43m 15.36s	-13° 50' 37.1"	0.7220822	0.2921360	2.43	19.8	57.1	-4.4	0.057	152.3	5.19	10.31	15.43
12/11/2010	13h 42m 28.65s	-13° 29' 56.9"	0.7219504	0.2955335	2.46	21.0	56.4	-4.4	0.065	150.5	5.13	10.26	15.39
13/11/2010	13h 41m 50.92s	-13° 10' 13.6"	0.7218196	0.2991562	2.49	22.3	55.8	-4.4	0.073	148.7	5.08	10.22	15.36
14/11/2010	13h 41m 22.27s	-12° 51' 30.9"	0.7216901	0.3029961	2.52	23.5	55.1	-4.5	0.081	146.9	5.02	10.17	15.33
15/11/2010	13h 41m 02.73s	-12° 33' 51.7"	0.7215618	0.3070447	2.55	24.6	54.3	-4.5	0.090	145.2	4.57	10.13	15.30
16/11/2010	13h 40m 52.29s	-12° 17' 18.7"	0.7214349	0.3112939	2.59	25.7	53.6	-4.5	0.098	143.5	4.52	10.09	15.27
17/11/2010	13h 40m 50.92s	-12° 01' 53.6"	0.7213095	0.3157352	2.63	26.8	52.8	-4.5	0.107	141.8	4.47	10.05	15.24
18/11/2010	13h 40m 58.53s	-11° 47' 38.0"	0.7211856	0.3203605	2.66	27.9	52.1	-4.5	0.116	140.1	4.42	10.01	15.21
19/11/2010	13h 41m 15.01s	-11° 34' 32.6"	0.7210634	0.3251614	2.70	28.9	51.3	-4.6	0.125	138.5	4.38	9.58	15.18
20/11/2010	13h 41m 40.22s	-11° 22' 37.9"	0.7209430	0.3301300	2.75	29.9	50.5	-4.6	0.135	136.9	4.33	9.54	15.16
21/11/2010	13h 42m 14.02s	-11° 11' 54.1"	0.7208245	0.3352584	2.79	30.8	49.8	-4.6	0.144	135.4	4.29	9.51	15.13
22/11/2010	13h 42m 56.22s	-11° 02' 20.6"	0.7207079	0.3405387	2.83	31.7	49.0	-4.6	0.153	133.9	4.26	9.48	15.10
23/11/2010	13h 43m 46.64s	-10° 53' 57.0"	0.7205934	0.3459634	2.88	32.6	48.2	-4.6	0.163	132.4	4.22	9.45	15.08
24/11/2010	13h 44m 45.06s	-10° 46' 42.2"	0.7204810	0.3515250	2.92	33.4	47.5	-4.6	0.172	131.0	4.19	9.42	15.05
25/11/2010	13h 45m 51.27s	-10° 40' 35.1"	0.7203709	0.3572163	2.97	34.2	46.7	-4.6	0.181	129.6	4.15	9.39	15.03
26/11/2010	13h 47m 05.06s	-10° 35' 34.2"	0.7202631	0.3630303	3.02	35.0	46.0	-4.6	0.191	128.2	4.12	9.36	15.00
27/11/2010	13h 48m 26.19s	-10° 31' 37.9"	0.7201577	0.3689602	3.07	35.7	45.2	-4.6	0.200	126.9	4.10	9.34	14.58
28/11/2010	13h 49m 54.43s	-10° 28' 44.4"	0.7200548	0.3749995	3.12	36.4	44.5	-4.6	0.209	125.6	4.07	9.31	14.56
29/11/2010	13h 51m 29.55s	-10° 26' 51.9"	0.7199544	0.3811420	3.17	37.1	43.8	-4.7	0.218	124.3	4.05	9.29	14.54
30/11/2010	13h 53m 11.31s	-10° 25' 58.3"	0.7198567	0.3873818	3.22	37.7	43.1	-4.7	0.227	123.1	4.02	9.27	14.52
01/12/2010	13h 54m 59.49s	-10° 26' 01.7"	0.7197618	0.3937132	3.27	38.3	42.4	-4.7	0.236	121.9	4.00	9.25	14.49
02/12/2010	13h 56m 53.86s	-10° 26' 59.9"	0.7196696	0.4001309	3.33	38.9	41.7	-4.7	0.245	120.7	3.58	9.23	14.47
03/12/2010	13h 58m 54.19s	-10° 28' 50.7"	0.7195803	0.4066301	3.38	39.4	41.0	-4.7	0.253	119.6	3.56	9.21	14.45
04/12/2010	14h 01m 00.28s	-10° 31' 32.1"	0.7194940	0.4132061	3.44	39.9	40.4	-4.7	0.262	118.4	3.55	9.19	14.43
05/12/2010	14h 03m 11.89s	-10° 35' 01.9"	0.7194107	0.4198546	3.49	40.4	39.7	-4.7	0.270	117.3	3.53	9.17	14.41
06/12/2010	14h 05m 28.85s	-10° 39' 17.9"	0.7193305	0.4265717	3.55	40.9	39.1	-4.7	0.279	116.3	3.52	9.16	14.39
07/12/2010	14h 07m 50.95s	-10° 44' 18.0"	0.7192534	0.4333535	3.60	41.3	38.5	-4.6	0.287	115.2	3.51	9.14	14.38
08/12/2010	14h 10m 18.00s	-10° 50' 00.2"	0.7191796	0.4401967	3.66	41.8	37.9	-4.6	0.295	114.2	3.49	9.13	14.36
09/12/2010	14h 12m 49.85s	-10° 56' 22.4"	0.7191090	0.4470978	3.72	42.1	37.3	-4.6	0.303	113.2	3.48	9.11	14.34
10/12/2010	14h 15m 26.31s	-11° 03' 22.5"	0.7190418	0.4540539	3.78	42.5	36.7	-4.6	0.311	112.2	3.48	9.10	14.32
11/12/2010	14h 18m 07.24s	-11° 10' 58.6"	0.7189779	0.4610620	3.83	42.9	36.2	-4.6	0.319	111.2	3.47	9.09	14.31
12/12/2010	14h 20m 52.50s	-11° 19' 08.8"	0.7189175	0.4681191	3.89	43.2	35.6	-4.6	0.327	110.3	3.46	9.08	14.29
13/12/2010	14h 23m 41.95s	-11° 27' 51.1"	0.7188606	0.4752227	3.95	43.5	35.1	-4.6	0.334	109.4	3.46	9.07	14.27
14/12/2010	14h 26m 35.45s	-11° 37' 03.6"	0.7188072	0.4823701	4.01	43.8	34.6	-4.6	0.342	108.5	3.45	9.06	14.26
15/12/2010	14h 29m 32.90s	-11° 46' 44.6"	0.7187573	0.4895588	4.07	44.1	34.1	-4.6	0.349	107.6	3.45	9.05	14.24
16/12/2010	14h 32m 34.16s	-11° 56' 52.2"	0.7187111	0.4967864	4.13	44.4	33.6	-4.6	0.356	106.7	3.45	9.04	14.23
17/12/2010	14h 35m 39.14s	-12° 07' 24.6"	0.7186686	0.5040507	4.19	44.6	33.1	-4.6	0.363	105.9	3.44	9.03	14.21
18/12/2010	14h 38m 47.73s	-12° 18' 20.1"	0.7186297	0.5113495	4.25	44.9	32.6	-4.6	0.370	105.0	3.44	9.02	14.20
19/12/2010	14h 41m 59.84s	-12° 29' 37.0"	0.7185946	0.5186805	4.31	45.1	32.2	-4.6	0.377	104.2	3.44	9.01	14.18
20/12/2010	14h 45m 15.36s	-12° 41' 13.6"	0.7185632	0.5260416	4.37	45.3	31.7	-4.6	0.384	103.4	3.44	9.01	14.17
21/12/2010	14h 48m 34.23s	-12° 53' 08.2"	0.7185355	0.5334309	4.44	45.5	31.3	-4.6	0.391	102.6	3.44	9.00	14.15
22/12/2010	14h 51m 56.35s	-13° 05' 19.3"	0.7185117	0.5408462	4.50	45.6	30.8	-4.6	0.398	101.8	3.45	8.59	14.14
23/12/2010	14h 55m 21.63s	-13° 17' 45.2"	0.7184917	0.5482854	4.56	45.8	30.4	-4.6	0.404	101.0	3.45	8.59	14.13
24/12/2010	14h 58m 50.02s	-13° 30' 24.3"	0.7184755	0.5557466	4.62	45.9	30.0	-4.5	0.411	100.3	3.45	8.59	14.11
25/12/2010	15h 02m 21.42s	-13° 43' 15.0"	0.7184631	0.5632278	4.68	46.1	29.6	-4.5	0.417	99.5	3.46	8.58	14.10
26/12/2010	15h 05m 55.76s	-13° 56' 15.8"	0.7184546	0.5707269	4.75	46.2	29.2	-4.5	0.424	98.8	3.46	8.58	14.09
27/12/2010	15h 09m 32.99s	-14° 09' 25.2"	0.7184500	0.5782421	4.81	46.3	28.9	-4.5	0.430	98.1	3.47	8.57	14.08
28/12/2010	15h 13m 13.02s	-14° 22' 41.7"	0.7184492	0.5857717	4.87	46.4	28.5	-4.5	0.436	97.4	3.47	8.57	14.07
29/12/2010	15h 16m 55.79s	-14° 36' 03.8"	0.7184523	0.5933140	4.93	46.5	28.1	-4.5	0.442	96.7	3.48	8.57	14.06
30/12/2010	15h 20m 41.24s	-14° 49' 30.1"	0.7184593	0.6008674	5.00	46.6	27.8	-4.5	0.448	96.0	3.49	8.57	14.05
31/12/2010	15h 24m 29.29s	-15° 02' 59.3"	0.7184701	0.6084305	5.06	46.7	27.4	-4.5	0.454	95.3	3.49	8.57	14.04

A.R., Dec. = coordinate apparenti  
Distance = distanza dalla Terra in U.A.  
El. = elongazione dal Sole in °  
Mag. = magnitudine

R. = distanza dal Sole in U.A.  
Light = distanza in minuti-luce  
Diam. = diametro in "

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

A.R., Dec. = apparent coordinates  
Distance = distance from the Earth in A.U.  
El. = elongation from the Sun in °  
Mag. = magnitude

R. = distance from the Sun in A.U.  
Light = distance in minutes  
Diam. = diameter in "

Times of rising and setting of the planet for Rome (42°N, 12°E), in U.T.+1

## FENOMENI DI VENERE - PHENOMENA OF VENUS

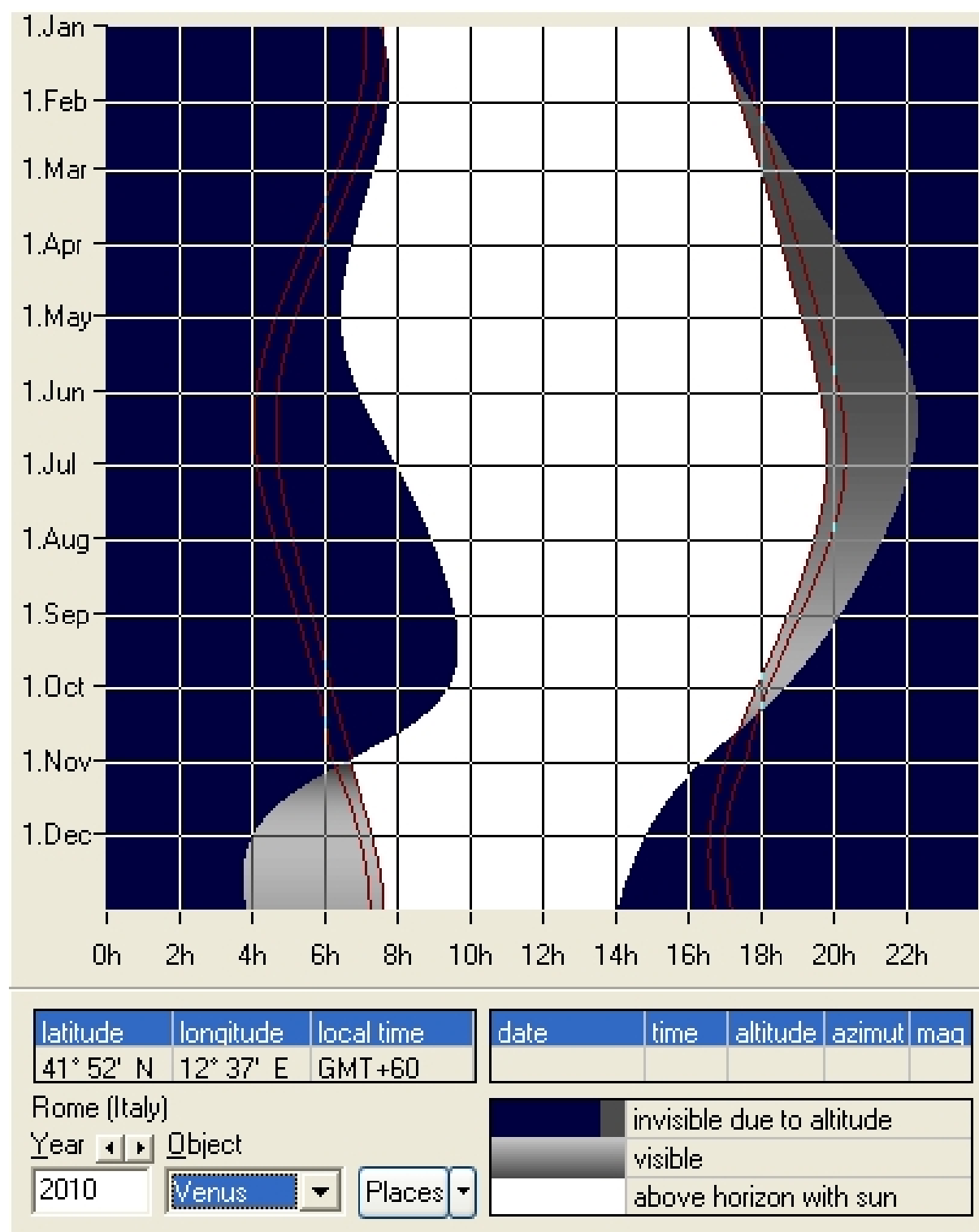
Perielio - Perihelion	16/05/2010	22.55.48	0.71840 AU
Perielio - Perihelion	27/12/2010	16.46.27	0.71845 AU
Afelio - Aphelion	24/01/2010	12.19.47	0.72826 AU
Afelio - Aphelion	06/09/2010	05.43.35	0.72825 AU
Perigeo - Perigee	29/10/2010	21.32.40	0.27150 AU
Apogeo - Apogee	13/01/2010	16.24.16	1.71129 AU
Magnit. Max - Brightness maximum	27/09/2010	15.00.09	-4.6 mag
Magnit. Max - Brightness maximum	02/12/2010	12.12.09	-4.7 mag
Magnit. Min - Brightness minimum	22/02/2010	05.49.10	-3.9 mag
Magnit. Min - Brightness minimum	29/10/2010	08.34.17	-4.0 mag
Max el. est - Greatest elong.east	20/08/2010	03.47.54	46.0 °
Max el. ovest - Greatest elong. west	Questo anno non avviene - No phenomenon		
Cong. Infer. - Inferior conjunction	29/10/2010	01.10.17	
Cong. Super. - Superior conjunction	11/01/2010	21.05.56	
Moto retrogr. - Retrograde motion	07/10/2010	19.01.54	
Moto diretto - Prograde motion	16/11/2010	15.39.12	
Max ang. Fase - Maximum phase angle	29/10/2010	11.37.58	171.8 °
Min ang. Fase - Minimum phase angle	11/01/2010	08.37.50	1.1 °

© (5)





# VISIBILITA' DI VENERE - VISIBILITY OF VENUS



Visibilità di Venere nel corso dell'anno - Visibility of Venus during the year

Le righe rosse più esterne indicano in quali periodi dell'anno il pianeta è sufficientemente distante dal Sole per poter essere osservato agevolmente. Le date esatte sono riportate nelle tabelle seguenti.

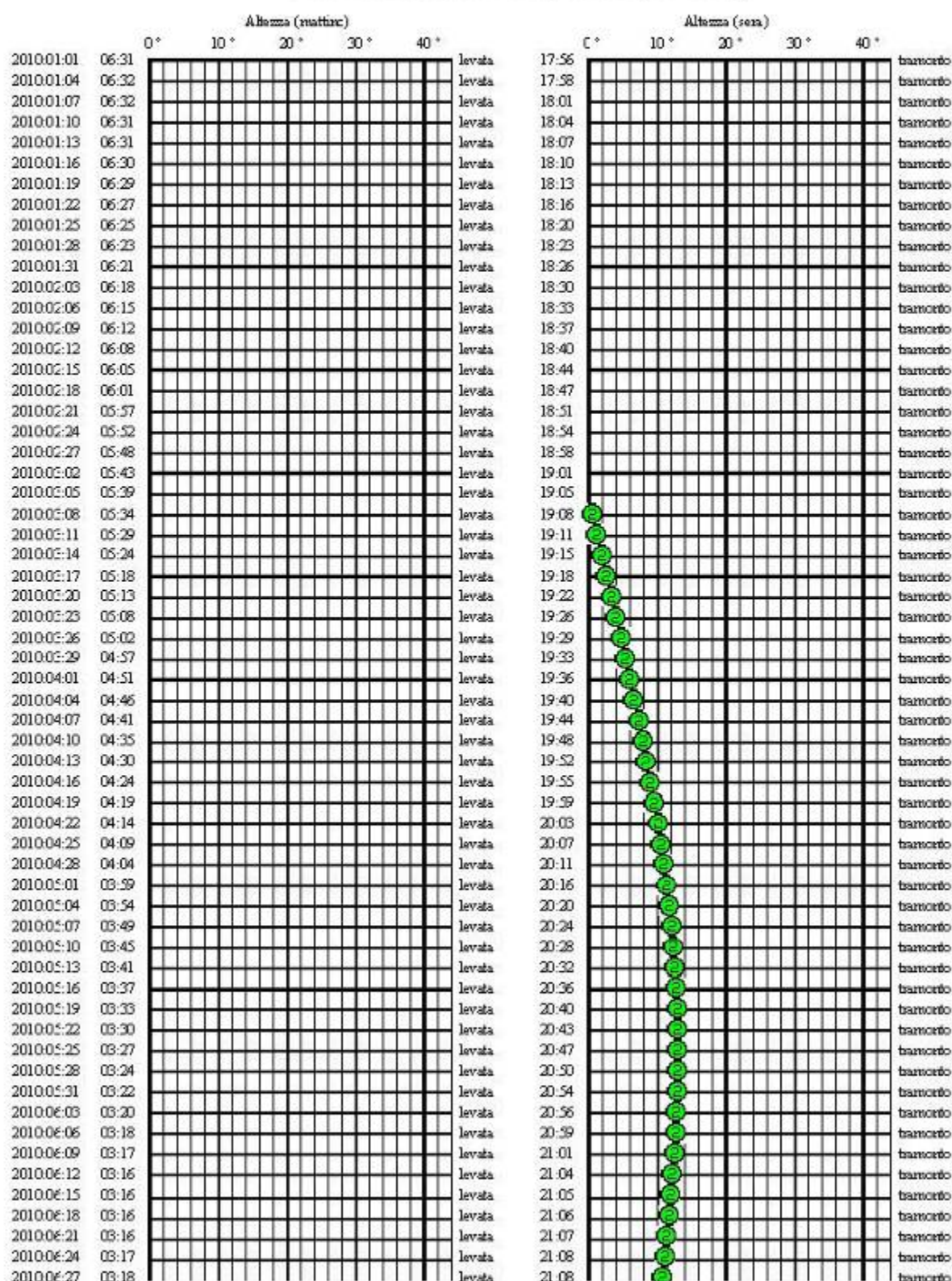
The external red lines show in what periods of the year the planet is sufficiently distant from the Sun to be able to be observed easily. The exact dates are in the following tables.

# Altezza ai crepuscoli

## di Venere

nel momento il cui il Sole è 12 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



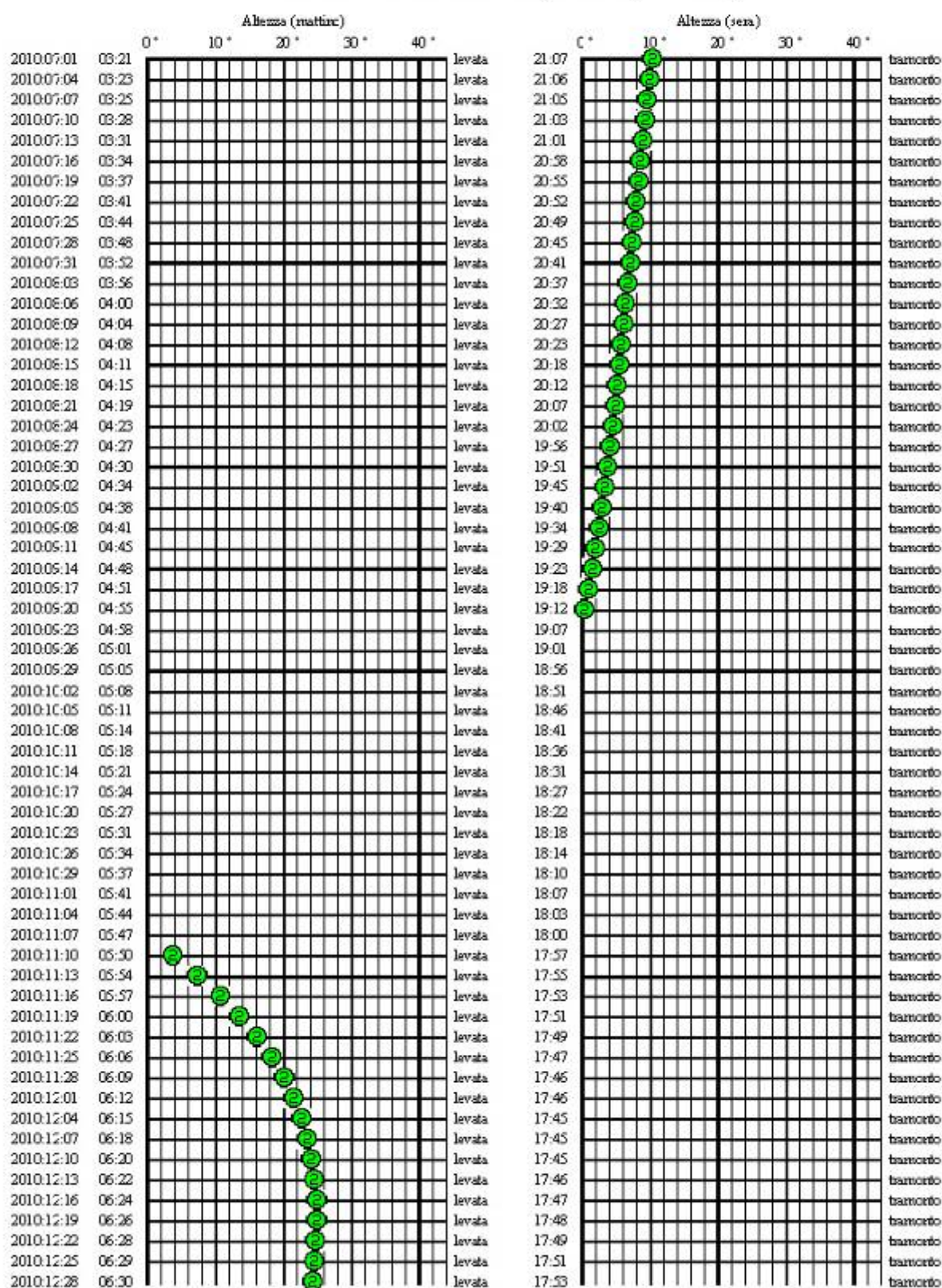


# Altezza ai crepuscoli

## di Venere

nel momento il cui il Sole è 12 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



Altezza ai crepuscoli. Il Sole è 12° sotto l'orizzonte

Altitude in the twilights. The Sun is 12° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:01:01	06:31	-10.5	112.4	2.6	17:56	-14.2	250.9	2.5
2010:01:04	06:32	-11.1	111.6	1.9	17:58	-13.7	250.7	1.8
2010:01:07	06:32	-11.7	110.7	1.3	18:01	-13.2	250.6	1.2
2010:01:10	06:31	-12.3	109.7	0.9	18:04	-12.6	250.7	0.8
2010:01:13	06:31	-12.9	108.5	0.9	18:07	-12.0	250.9	1.0
2010:01:16	06:30	-13.4	107.3	1.4	18:10	-11.4	251.2	1.5
2010:01:19	06:29	-13.9	105.9	2.0	18:13	-10.8	251.6	2.2
2010:01:22	06:27	-14.4	104.4	2.7	18:16	-10.2	252.1	2.8
2010:01:25	06:25	-14.9	102.8	3.4	18:20	-9.5	252.7	3.5
2010:01:28	06:23	-15.3	101.2	4.1	18:23	-8.8	253.4	4.2
2010:01:31	06:21	-15.7	99.4	4.8	18:26	-8.1	254.2	4.9
2010:02:03	06:18	-16.1	97.6	5.5	18:30	-7.5	255.1	5.6
2010:02:06	06:15	-16.4	95.7	6.2	18:33	-6.7	256.1	6.4
2010:02:09	06:12	-16.7	93.7	6.9	18:37	-6.0	257.1	7.1
2010:02:12	06:08	-17.0	91.7	7.7	18:40	-5.3	258.3	7.8
2010:02:15	06:05	-17.3	89.6	8.4	18:44	-4.6	259.4	8.5
2010:02:18	06:01	-17.5	87.5	9.1	18:47	-3.9	260.7	9.2
2010:02:21	05:57	-17.8	85.2	9.8	18:51	-3.2	262.0	9.9
2010:02:24	05:52	-18.0	83.0	10.5	18:54	-2.4	263.3	10.6
2010:02:27	05:48	-18.2	80.7	11.2	18:58	-1.7	264.7	11.4
2010:03:02	05:43	-18.3	78.4	12.0	19:01	-1.0	266.1	12.1
2010:03:05	05:39	-18.5	76.0	12.7	19:05	-0.3	267.5	12.8
2010:03:08	05:34	-18.6	73.6	13.4	19:08	0.4	268.9	13.5
2010:03:11	05:29	-18.7	71.2	14.1	19:11	1.2	270.3	14.3
2010:03:14	05:24	-18.8	68.8	14.8	19:15	1.9	271.8	15.0
2010:03:17	05:18	-18.9	66.3	15.6	19:18	2.6	273.2	15.7
2010:03:20	05:13	-19.0	63.9	16.3	19:22	3.3	274.6	16.4
2010:03:23	05:08	-19.0	61.4	17.0	19:26	3.9	276.0	17.2
2010:03:26	05:02	-19.1	58.9	17.8	19:29	4.6	277.4	17.9
2010:03:29	04:57	-19.1	56.5	18.5	19:33	5.3	278.8	18.6
2010:04:01	04:51	-19.2	54.0	19.2	19:36	5.9	280.1	19.4
2010:04:04	04:46	-19.2	51.5	20.0	19:40	6.6	281.4	20.1
2010:04:07	04:41	-19.2	49.1	20.7	19:44	7.2	282.6	20.8
2010:04:10	04:35	-19.3	46.6	21.4	19:48	7.8	283.8	21.6
2010:04:13	04:30	-19.3	44.2	22.2	19:52	8.4	284.9	22.3
2010:04:16	04:24	-19.4	41.8	22.9	19:55	9.0	286.0	23.0
2010:04:19	04:19	-19.4	39.4	23.6	19:59	9.5	286.9	23.8
2010:04:22	04:14	-19.5	37.1	24.4	20:03	10.0	287.9	24.5
2010:04:25	04:09	-19.5	34.8	25.1	20:07	10.5	288.7	25.3
2010:04:28	04:04	-19.6	32.5	25.8	20:11	10.9	289.5	26.0
2010:05:01	03:59	-19.7	30.3	26.6	20:16	11.3	290.1	26.7
2010:05:04	03:54	-19.9	28.1	27.3	20:20	11.7	290.7	27.4
2010:05:07	03:49	-20.0	26.0	28.0	20:24	12.0	291.2	28.2
2010:05:10	03:45	-20.2	23.9	28.7	20:28	12.3	291.6	28.9
2010:05:13	03:41	-20.4	21.9	29.5	20:32	12.5	291.9	29.6
2010:05:16	03:37	-20.7	20.0	30.2	20:36	12.7	292.1	30.3
2010:05:19	03:33	-21.0	18.2	30.9	20:40	12.8	292.2	31.0
2010:05:22	03:30	-21.3	16.4	31.6	20:43	12.9	292.2	31.8
2010:05:25	03:27	-21.7	14.7	32.3	20:47	13.0	292.1	32.5
2010:05:28	03:24	-22.1	13.2	33.0	20:50	12.9	291.9	33.2
2010:05:31	03:22	-22.6	11.7	33.7	20:54	12.9	291.6	33.8
2010:06:03	03:20	-23.1	10.4	34.4	20:56	12.8	291.2	34.5
2010:06:06	03:18	-23.7	9.2	35.0	20:59	12.6	290.7	35.2
2010:06:09	03:17	-24.4	8.1	35.7	21:01	12.4	290.1	35.9
2010:06:12	03:16	-25.1	7.2	36.3	21:04	12.2	289.4	36.5
2010:06:15	03:16	-25.9	6.4	37.0	21:05	11.9	288.6	37.2
2010:06:18	03:16	-26.8	5.7	37.6	21:06	11.7	287.7	37.8
2010:06:21	03:16	-27.7	5.2	38.2	21:07	11.4	286.7	38.4
2010:06:24	03:17	-28.7	4.9	38.9	21:08	11.0	285.7	39.0
2010:06:27	03:18	-29.8	4.8	39.5	21:08	10.7	284.6	39.6
2010:06:30	03:20	-30.9	4.8	40.0	21:07	10.4	283.3	40.2

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:07:01	03:21	-31.3	4.8	40.2	21:07	10.3	282.9	40.4
2010:07:04	03:23	-32.4	5.1	40.8	21:06	9.9	281.6	40.9
2010:07:07	03:25	-33.7	5.5	41.3	21:05	9.6	280.2	41.4
2010:07:10	03:28	-34.9	6.1	41.8	21:03	9.3	278.8	42.0
2010:07:13	03:31	-36.2	6.9	42.3	21:01	8.9	277.3	42.5
2010:07:16	03:34	-37.5	7.8	42.8	20:58	8.6	275.7	42.9
2010:07:19	03:37	-38.8	8.9	43.3	20:55	8.3	274.1	43.4
2010:07:22	03:41	-40.1	10.2	43.7	20:52	7.9	272.5	43.8
2010:07:25	03:44	-41.4	11.7	44.1	20:49	7.6	270.8	44.2
2010:07:28	03:48	-42.7	13.3	44.5	20:45	7.3	269.1	44.5
2010:07:31	03:52	-43.9	15.1	44.8	20:41	7.0	267.4	44.9
2010:08:03	03:56	-45.2	17.0	45.1	20:37	6.7	265.7	45.2
2010:08:06	04:00	-46.3	19.1	45.4	20:32	6.4	264.0	45.4
2010:08:09	04:04	-47.5	21.4	45.6	20:27	6.1	262.2	45.6
2010:08:12	04:08	-48.5	23.8	45.8	20:23	5.8	260.5	45.8
2010:08:15	04:11	-49.5	26.4	45.9	20:18	5.5	258.8	45.9
2010:08:18	04:15	-50.4	29.1	45.9	20:12	5.1	257.1	46.0
2010:08:21	04:19	-51.2	32.0	46.0	20:07	4.8	255.5	46.0
2010:08:24	04:23	-51.9	34.9	45.9	20:02	4.5	253.9	45.9
2010:08:27	04:27	-52.5	38.0	45.8	19:56	4.1	252.3	45.7
2010:08:30	04:30	-52.9	41.2	45.6	19:51	3.8	250.9	45.5
2010:09:02	04:34	-53.2	44.5	45.3	19:45	3.4	249.5	45.2
2010:09:05	04:38	-53.4	47.9	44.9	19:40	2.9	248.1	44.8
2010:09:08	04:41	-53.4	51.3	44.3	19:34	2.5	246.9	44.2
2010:09:11	04:45	-53.3	54.7	43.7	19:29	2.0	245.8	43.6
2010:09:14	04:48	-52.9	58.2	42.9	19:23	1.5	244.8	42.8
2010:09:17	04:51	-52.4	61.7	42.0	19:18	0.9	244.0	41.8
2010:09:20	04:55	-51.6	65.1	40.9	19:12	0.2	243.4	40.6
2010:09:23	04:58	-50.6	68.5	39.6	19:07	-0.5	242.9	39.3
2010:09:26	05:01	-49.3	71.8	38.1	19:01	-1.3	242.7	37.7
2010:09:29	05:05	-47.7	75.1	36.3	18:56	-2.2	242.7	35.9
2010:10:02	05:08	-45.8	78.3	34.2	18:51	-3.2	242.9	33.8
2010:10:05	05:11	-43.6	81.4	31.9	18:46	-4.3	243.5	31.4
2010:10:08	05:14	-41.1	84.4	29.3	18:41	-5.5	244.4	28.7
2010:10:11	05:18	-38.2	87.3	26.3	18:36	-6.9	245.6	25.7
2010:10:14	05:21	-34.9	90.2	22.9	18:31	-8.5	247.3	22.3
2010:10:17	05:24	-31.2	92.9	19.3	18:27	-10.1	249.2	18.6
2010:10:20	05:27	-27.2	95.6	15.5	18:22	-11.9	251.6	14.7
2010:10:23	05:31	-23.0	98.2	11.5	18:18	-13.8	254.3	10.8
2010:10:26	05:34	-18.4	100.7	7.9	18:14	-15.7	257.2	7.4
2010:10:29	05:37	-13.8	103.2	6.0	18:10	-17.7	260.4	6.0
2010:11:01	05:41	-9.2	105.6	7.3	18:07	-19.5	263.6	7.9
2010:11:04	05:44	-4.7	108.0	10.8	18:03	-21.4	266.9	11.5
2010:11:07	05:47	-0.3	110.4	14.8	18:00	-23.0	270.1	15.5
2010:11:10	05:50	3.7	112.7	18.8	17:57	-24.6	273.1	19.4
2010:11:13	05:54	7.4	115.0	22.5	17:55	-26.1	275.9	23.1
2010:11:16	05:57	10.7	117.3	26.0	17:53	-27.4	278.5	26.5
2010:11:19	06:00	13.6	119.5	29.1	17:51	-28.6	280.7	29.6
2010:11:22	06:03	16.1	121.7	31.9	17:49	-29.8	282.7	32.3
2010:11:25	06:06	18.2	123.9	34.4	17:47	-30.9	284.3	34.7
2010:11:28	06:09	20.0	125.9	36.5	17:46	-31.9	285.7	36.9
2010:12:01	06:12	21.5	127.9	38.4	17:46	-32.9	286.9	38.7
2010:12:04	06:15	22.6	129.8	40.0	17:45	-33.9	287.9	40.3
2010:12:07	06:18	23.5	131.6	41.4	17:45	-34.9	288.6	41.6
2010:12:10	06:20	24.2	133.3	42.6	17:45	-35.9	289.2	42.8
2010:12:13	06:22	24.6	134.8	43.6	17:46	-36.9	289.7	43.7
2010:12:16	06:24	24.8	136.2	44.4	17:47	-37.9	290.0	44.6
2010:12:19	06:26	24.9	137.5	45.1	17:48	-38.9	290.2	45.2
2010:12:22	06:28	24.8	138.6	45.7	17:49	-39.9	290.4	45.8
2010:12:25	06:29	24.6	139.6	46.1	17:51	-40.8	290.4	46.2
2010:12:28	06:30	24.2	140.4	46.5	17:53	-41.8	290.4	46.5
2010:12:31	06:31	23.8	141.1	46.7	17:55	-42.7	290.4	46.7

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

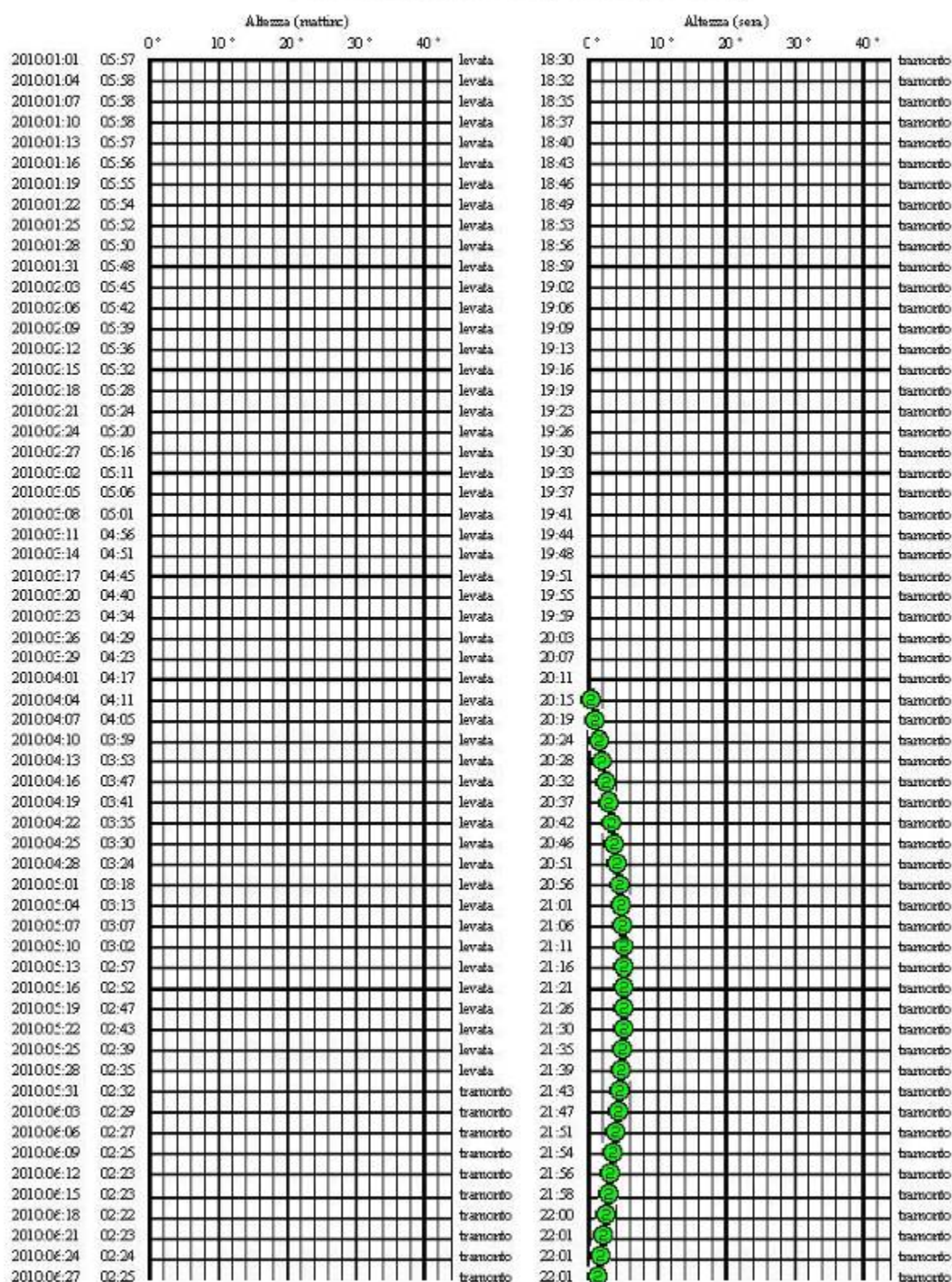


# Altezza ai crepuscoli

## di Venere

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



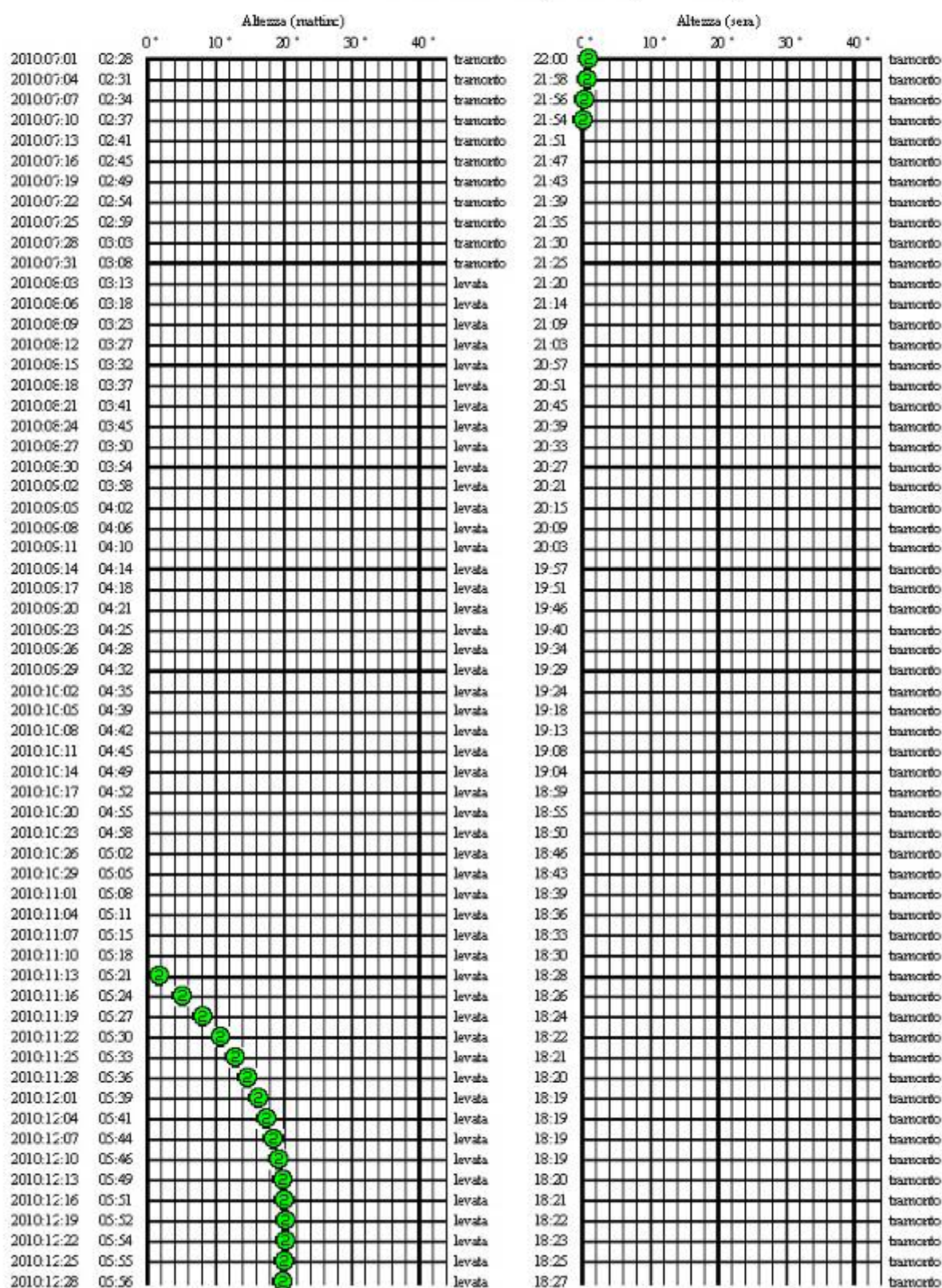


# Altezza ai crepuscoli

## di Venere

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:01:01	05:57	-16.4	107.3	2.6	18:30	-20.2	255.9	2.5
2010:01:04	05:58	-17.1	106.5	1.9	18:32	-19.7	255.8	1.8
2010:01:07	05:58	-17.7	105.6	1.3	18:35	-19.2	255.7	1.2
2010:01:10	05:58	-18.3	104.6	0.9	18:37	-18.6	255.8	0.8
2010:01:13	05:57	-18.9	103.4	0.9	18:40	-18.0	256.0	1.0
2010:01:16	05:56	-19.4	102.2	1.4	18:43	-17.4	256.3	1.5
2010:01:19	05:55	-19.9	100.8	2.0	18:46	-16.7	256.7	2.2
2010:01:22	05:54	-20.4	99.3	2.7	18:49	-16.1	257.2	2.8
2010:01:25	05:52	-20.9	97.7	3.4	18:53	-15.4	257.9	3.5
2010:01:28	05:50	-21.3	96.0	4.1	18:56	-14.8	258.6	4.2
2010:01:31	05:48	-21.7	94.2	4.8	18:59	-14.1	259.4	4.9
2010:02:03	05:45	-22.1	92.4	5.5	19:02	-13.4	260.3	5.7
2010:02:06	05:42	-22.4	90.4	6.2	19:06	-12.7	261.3	6.4
2010:02:09	05:39	-22.8	88.4	6.9	19:09	-12.0	262.4	7.1
2010:02:12	05:36	-23.0	86.3	7.7	19:13	-11.3	263.5	7.8
2010:02:15	05:32	-23.3	84.1	8.4	19:16	-10.5	264.7	8.5
2010:02:18	05:28	-23.5	81.9	9.1	19:19	-9.8	266.0	9.2
2010:02:21	05:24	-23.7	79.6	9.8	19:23	-9.1	267.3	9.9
2010:02:24	05:20	-23.9	77.2	10.5	19:26	-8.4	268.7	10.7
2010:02:27	05:16	-24.0	74.8	11.2	19:30	-7.7	270.0	11.4
2010:03:02	05:11	-24.2	72.4	12.0	19:33	-7.0	271.4	12.1
2010:03:05	05:06	-24.3	69.9	12.7	19:37	-6.3	272.9	12.8
2010:03:08	05:01	-24.3	67.4	13.4	19:41	-5.6	274.3	13.5
2010:03:11	04:56	-24.4	64.9	14.1	19:44	-4.9	275.8	14.3
2010:03:14	04:51	-24.4	62.3	14.8	19:48	-4.2	277.3	15.0
2010:03:17	04:45	-24.4	59.7	15.6	19:51	-3.5	278.7	15.7
2010:03:20	04:40	-24.4	57.1	16.3	19:55	-2.9	280.2	16.4
2010:03:23	04:34	-24.3	54.5	17.0	19:59	-2.2	281.6	17.2
2010:03:26	04:29	-24.3	51.9	17.8	20:03	-1.5	283.0	17.9
2010:03:29	04:23	-24.2	49.3	18.5	20:07	-0.9	284.4	18.6
2010:04:01	04:17	-24.1	46.6	19.2	20:11	-0.3	285.8	19.4
2010:04:04	04:11	-24.0	44.0	19.9	20:15	0.3	287.1	20.1
2010:04:07	04:05	-23.9	41.4	20.7	20:19	0.9	288.4	20.8
2010:04:10	03:59	-23.8	38.7	21.4	20:24	1.4	289.6	21.6
2010:04:13	03:53	-23.7	36.1	22.1	20:28	2.0	290.8	22.3
2010:04:16	03:47	-23.6	33.5	22.9	20:32	2.5	291.9	23.1
2010:04:19	03:41	-23.4	30.9	23.6	20:37	2.9	293.0	23.8
2010:04:22	03:35	-23.3	28.4	24.4	20:42	3.4	294.0	24.5
2010:04:25	03:30	-23.2	25.8	25.1	20:46	3.8	294.9	25.3
2010:04:28	03:24	-23.1	23.3	25.8	20:51	4.1	295.7	26.0
2010:05:01	03:18	-23.0	20.9	26.5	20:56	4.4	296.5	26.7
2010:05:04	03:13	-22.9	18.4	27.3	21:01	4.7	297.2	27.5
2010:05:07	03:07	-22.8	16.1	28.0	21:06	4.9	297.8	28.2
2010:05:10	03:02	-22.8	13.7	28.7	21:11	5.0	298.3	28.9
2010:05:13	02:57	-22.8	11.5	29.4	21:16	5.1	298.7	29.6
2010:05:16	02:52	-22.8	9.2	30.2	21:21	5.2	299.0	30.3
2010:05:19	02:47	-22.8	7.1	30.9	21:26	5.1	299.3	31.1
2010:05:22	02:43	-22.9	5.0	31.6	21:30	5.0	299.4	31.8
2010:05:25	02:39	-23.1	3.1	32.3	21:35	4.9	299.5	32.5
2010:05:28	02:35	-23.2	1.2	33.0	21:39	4.7	299.4	33.2
2010:05:31	02:32	-23.5	359.4	33.7	21:43	4.5	299.3	33.8
2010:06:03	02:29	-23.8	357.8	34.3	21:47	4.2	299.0	34.5
2010:06:06	02:27	-24.2	356.3	35.0	21:51	3.9	298.7	35.2
2010:06:09	02:25	-24.7	354.9	35.7	21:54	3.6	298.2	35.9
2010:06:12	02:23	-25.2	353.7	36.3	21:56	3.2	297.7	36.5
2010:06:15	02:23	-25.8	352.7	37.0	21:58	2.8	297.0	37.2
2010:06:18	02:22	-26.6	351.8	37.6	22:00	2.4	296.2	37.8
2010:06:21	02:23	-27.4	351.1	38.2	22:01	2.1	295.3	38.4
2010:06:24	02:24	-28.3	350.6	38.8	22:01	1.7	294.2	39.0
2010:06:27	02:25	-29.3	350.3	39.4	22:01	1.3	293.1	39.6
2010:06:30	02:27	-30.4	350.1	40.0	22:00	1.0	291.9	40.2

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:07:01	02:28	-30.8	350.1	40.2	22:00	0.9	291.4	40.4
2010:07:04	02:31	-32.0	350.3	40.8	21:58	0.6	290.1	40.9
2010:07:07	02:34	-33.3	350.6	41.3	21:56	0.3	288.6	41.5
2010:07:10	02:37	-34.7	351.1	41.8	21:54	0.1	287.1	42.0
2010:07:13	02:41	-36.1	351.8	42.3	21:51	-0.2	285.5	42.5
2010:07:16	02:45	-37.5	352.7	42.8	21:47	-0.4	283.8	42.9
2010:07:19	02:49	-39.0	353.8	43.3	21:43	-0.6	282.0	43.4
2010:07:22	02:54	-40.5	355.0	43.7	21:39	-0.7	280.3	43.8
2010:07:25	02:59	-42.0	356.4	44.1	21:35	-0.9	278.4	44.2
2010:07:28	03:03	-43.5	358.0	44.5	21:30	-1.0	276.6	44.5
2010:07:31	03:08	-45.0	359.8	44.8	21:25	-1.2	274.7	44.9
2010:08:03	03:13	-46.5	1.7	45.1	21:20	-1.3	272.9	45.2
2010:08:06	03:18	-47.9	3.8	45.4	21:14	-1.4	271.0	45.4
2010:08:09	03:23	-49.3	6.1	45.6	21:09	-1.6	269.1	45.6
2010:08:12	03:27	-50.6	8.6	45.8	21:03	-1.7	267.3	45.8
2010:08:15	03:32	-51.9	11.3	45.9	20:57	-1.8	265.5	45.9
2010:08:18	03:37	-53.0	14.1	45.9	20:51	-2.0	263.7	46.0
2010:08:21	03:41	-54.1	17.1	46.0	20:45	-2.1	261.9	46.0
2010:08:24	03:45	-55.1	20.3	45.9	20:39	-2.3	260.2	45.9
2010:08:27	03:50	-56.0	23.7	45.8	20:33	-2.5	258.5	45.7
2010:08:30	03:54	-56.7	27.2	45.6	20:27	-2.7	256.9	45.5
2010:09:02	03:58	-57.3	30.9	45.3	20:21	-3.0	255.4	45.2
2010:09:05	04:02	-57.8	34.7	44.9	20:15	-3.3	254.0	44.8
2010:09:08	04:06	-58.0	38.7	44.4	20:09	-3.6	252.7	44.2
2010:09:11	04:10	-58.1	42.7	43.7	20:03	-4.0	251.5	43.6
2010:09:14	04:14	-58.0	46.9	42.9	19:57	-4.4	250.5	42.7
2010:09:17	04:18	-57.6	51.0	42.0	19:51	-4.9	249.6	41.8
2010:09:20	04:21	-57.0	55.2	40.9	19:46	-5.5	248.8	40.6
2010:09:23	04:25	-56.1	59.3	39.6	19:40	-6.1	248.3	39.3
2010:09:26	04:28	-55.0	63.3	38.1	19:34	-6.9	248.0	37.7
2010:09:29	04:32	-53.5	67.2	36.3	19:29	-7.7	247.9	35.9
2010:10:02	04:35	-51.7	71.0	34.3	19:24	-8.7	248.1	33.8
2010:10:05	04:39	-49.6	74.6	31.9	19:18	-9.8	248.6	31.4
2010:10:08	04:42	-47.1	78.1	29.3	19:13	-11.1	249.5	28.7
2010:10:11	04:45	-44.2	81.4	26.3	19:08	-12.5	250.7	25.7
2010:10:14	04:49	-40.9	84.5	23.0	19:04	-14.1	252.3	22.3
2010:10:17	04:52	-37.3	87.5	19.4	18:59	-15.8	254.2	18.6
2010:10:20	04:55	-33.3	90.3	15.5	18:55	-17.7	256.6	14.7
2010:10:23	04:58	-29.0	93.0	11.5	18:50	-19.7	259.3	10.8
2010:10:26	05:02	-24.4	95.6	7.9	18:46	-21.7	262.3	7.4
2010:10:29	05:05	-19.8	98.1	6.0	18:43	-23.6	265.5	6.0
2010:11:01	05:08	-15.1	100.5	7.3	18:39	-25.6	268.9	7.9
2010:11:04	05:11	-10.5	102.8	10.8	18:36	-27.4	272.4	11.5
2010:11:07	05:15	-6.1	105.0	14.8	18:33	-29.1	275.7	15.5
2010:11:10	05:18	-2.0	107.2	18.7	18:30	-30.7	279.0	19.4
2010:11:13	05:21	1.7	109.4	22.5	18:28	-32.1	282.0	23.1
2010:11:16	05:24	5.1	111.4	26.0	18:26	-33.4	284.7	26.5
2010:11:19	05:27	8.1	113.5	29.1	18:24	-34.6	287.2	29.6
2010:11:22	05:30	10.7	115.5	31.9	18:22	-35.7	289.3	32.4
2010:11:25	05:33	12.9	117.4	34.4	18:21	-36.8	291.2	34.8
2010:11:28	05:36	14.8	119.3	36.5	18:20	-37.8	292.8	36.9
2010:12:01	05:39	16.3	121.1	38.4	18:19	-38.8	294.1	38.7
2010:12:04	05:41	17.6	122.8	40.0	18:19	-39.8	295.2	40.3
2010:12:07	05:44	18.6	124.4	41.4	18:19	-40.8	296.1	41.6
2010:12:10	05:46	19.3	126.0	42.6	18:19	-41.7	296.9	42.8
2010:12:13	05:49	19.8	127.4	43.6	18:20	-42.7	297.5	43.8
2010:12:16	05:51	20.2	128.8	44.4	18:21	-43.7	297.9	44.6
2010:12:19	05:52	20.3	130.0	45.1	18:22	-44.7	298.2	45.2
2010:12:22	05:54	20.3	131.1	45.7	18:23	-45.6	298.5	45.8
2010:12:25	05:55	20.2	132.1	46.1	18:25	-46.6	298.6	46.2
2010:12:28	05:56	19.9	132.9	46.4	18:27	-47.5	298.7	46.5
2010:12:31	05:57	19.5	133.6	46.7	18:29	-48.4	298.7	46.7

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

heliacal dates for Venus in 2010  
location : Rome (Italy)  
latitude : 41° 52' 12'' N  
longitude: 12° 37' 12'' E  
variable arcus visionis:  
arcvis [°] = 10.5 + 1.4 \* magnitude  
critical altitude: 0.00°

date eliache per Venere  
posizione : Roma  
latitudine : 41° 52' 12'' N  
longitudine: 12° 37' 12'' E  
visibilità minima [°] = 10.5 + 1.4 \* magnitudine  
altezza critica : 0.00°

	date	obj r/s	sun r/s	d r/s	age	mag
evening visibility begins	2010-02-07	18:00	17:32	0:27h	26d 20h	-3.4
evening visibility ends	2010-10-11	17:56	17:35	0:21h	-17d 08h	-4.1
morning visibility begins	2010-11-03	06:14	06:43	-0:29h	5d 04h	-3.4

Date : data nel formato mese/giorno  
Obj r/s : ora del tramonto o della levata del pianeta  
Sun r/s: ora del tramonto o della levata del Sole  
D r/s : differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due oggetti  
Age : giorni trascorsi dalla congiunzione col Sole  
Mag : magnitudine  
Morning visibility begins = inizio visibilità mattutina  
Morning visibility ends = fine visibilità mattutina  
Evening visibility begins = inizio visibilità serale  
Evening visibility ends = fine visibilità serale

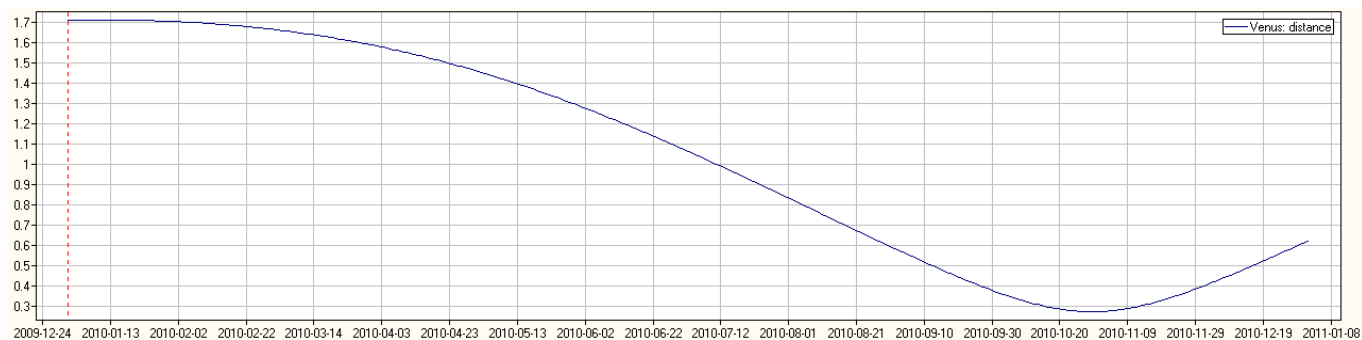
Obj r/s : rising and setting of the planet  
Sun r/s : sunrise and sunset  
D r/s : difference in hours and minutes between the instants of the rising or the setting of the two objects  
Age : days from the conjunction with the Sun  
Mag : magnitude

	date	obj r/s	sun r/s	sun alt	sun lon	obj lon	obj lat	mag	d az	d lon
EF	02-07	18:00	17:32	-5° 49'	318° 49'	325° 14'	-1° 25'	-3.4	-3° 53'	6° 26'
EL	10-11	17:56	17:35	-4° 51'	198° 16'	223° 00'	-7° 17'	-4.1	-25° 23'	24° 44'
MF	11-03	06:14	06:43	-6° 08'	220° 41'	212° 26'	-4° 53'	-3.4	7° 46'	-8° 14'

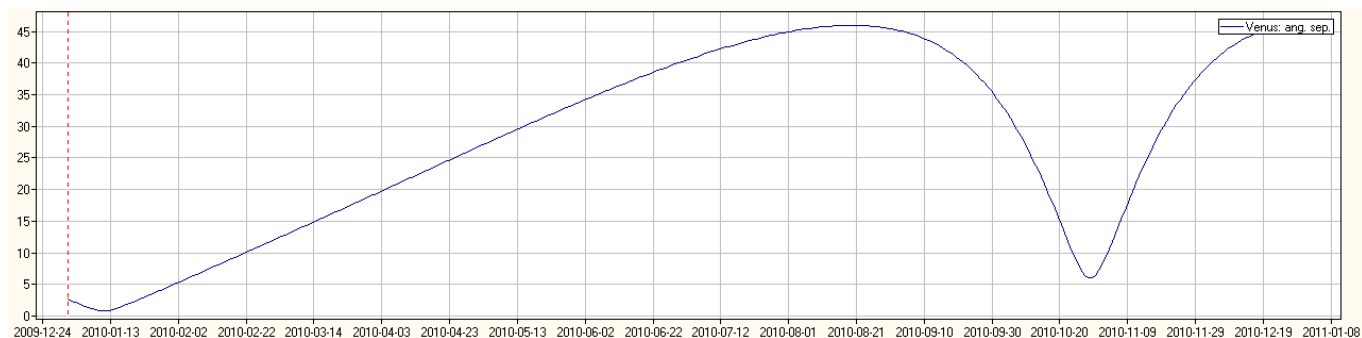
MF : prima visibilità mattutina  
ML : ultima visibilità mattutina  
EF : prima visibilità serale  
EL : ultima visibilità serale  
Date : data nel formato mese/giorno  
Sun alt : altezza del Sole nell'istante di visibilità del pianeta  
Sun lon : longitudine celeste del Sole  
Obj lon : longitudine celeste del pianeta  
Obj lat : latitudine celeste del pianeta  
Mag : magnitudine  
D az : differenza in azimut tra i centri del Sole e del pianeta nell'istante della sua visibilità  
D lon : differenza in longitudine tra i centri del Sole e del pianeta nell'istante della sua visibilità

Date : date in the format month/day  
Sun alt : altitude of the Sun in the instant of visibility of the planet  
Sun lon : celestial longitude of the Sun  
Obj lon : celestial longitude of the planet  
Obj lat : Celestial latitude of the planet  
Mag : magnitude  
D az : difference in azimuth between the centers of the Sun and the planet in the instant of its visibility  
D lon : difference in longitude between the centers of the Sun and the planet in the instant of its visibility

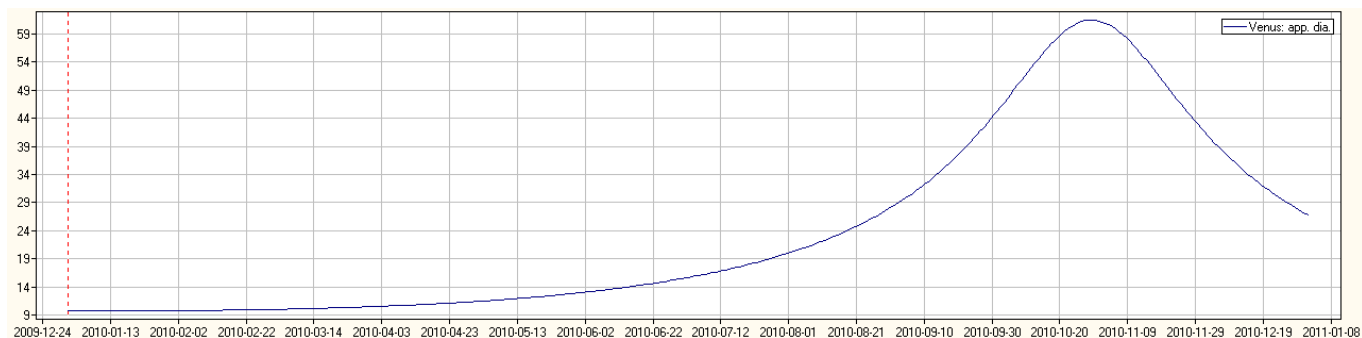
© (3)



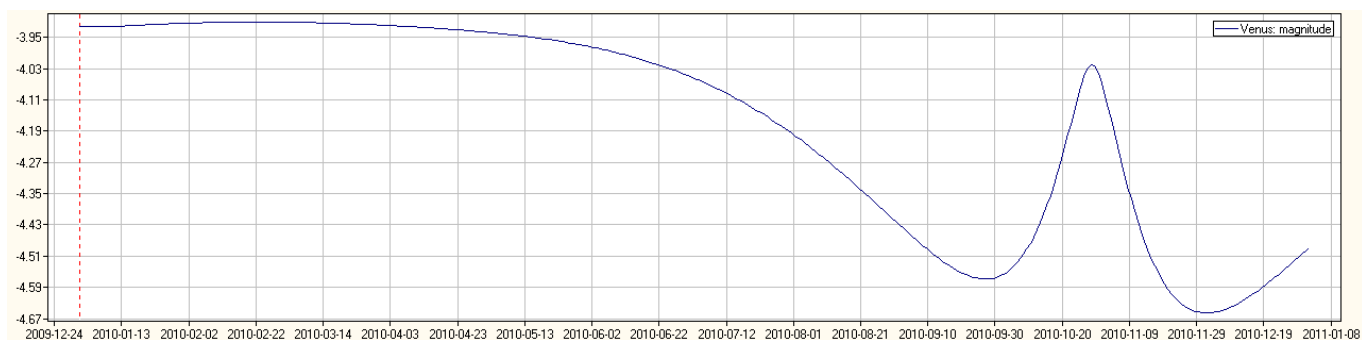
Distanza di Venere in U.A. nel corso dell'anno - Distance of Venus in A.U. during the year



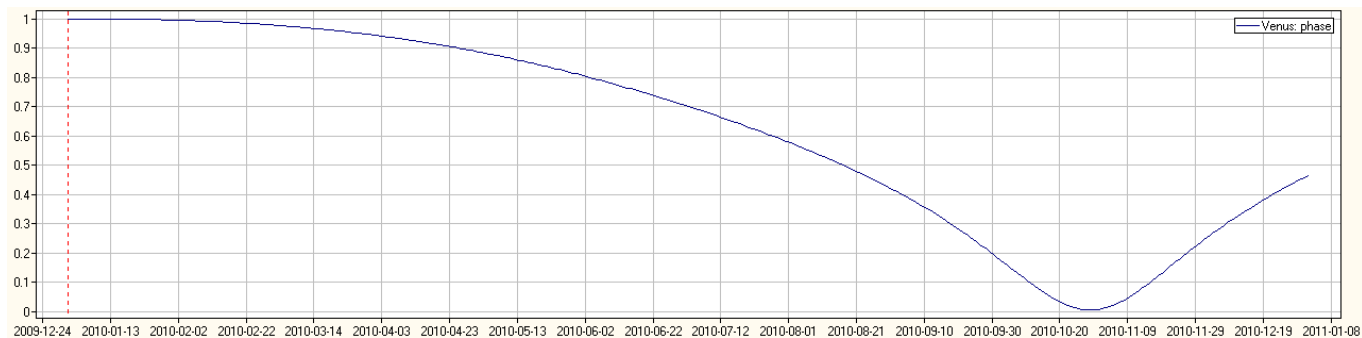
Elongazione di Venere in ° nel corso dell'anno - Elongation of Venus in ° during the year



Diametro di Venere in " nel corso dell'anno - Diameter of Venus in " during the year

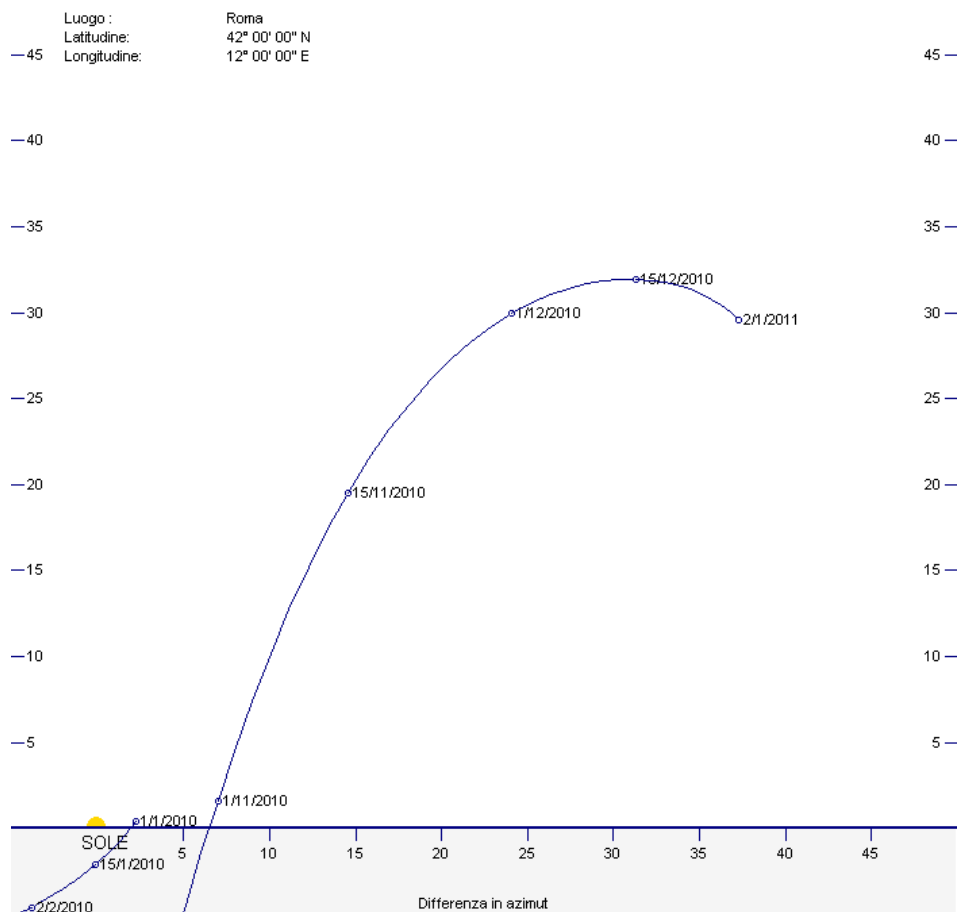


Magnitudine di Venere nel corso dell'anno - Magnitude of Venus during the year

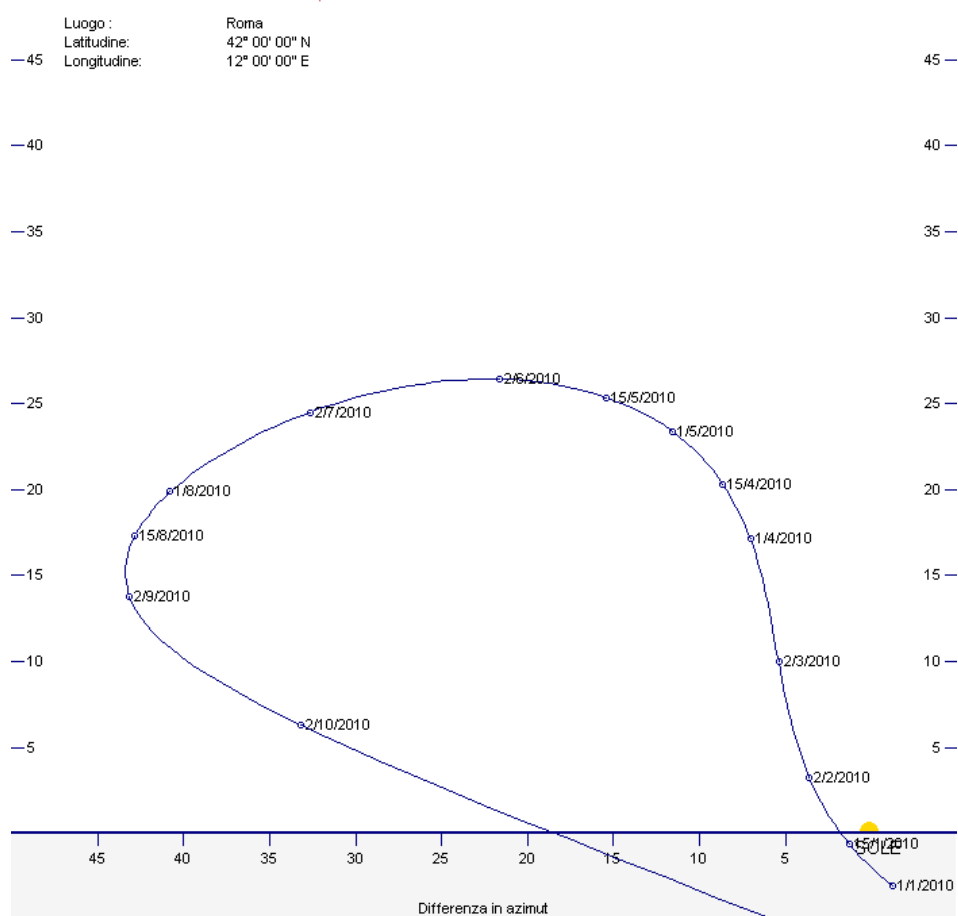


Fase di Venere nel corso dell'anno - Phase of Venus during the year

### Posizione di Venere al mattino rispetto al sorgere del Sole



### Posizione di Venere alla sera rispetto al tramonto del Sole



Posizione relativa di Venere rispetto al Sole al suo momento del sorgere e del tramonto

Relative position of Venus respect to the sunrising and sunsetting

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# EFFEMERIDI DI MARTE - EPHEMERIDES OF MARS

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle'	Rise	Transit	Set
01/01/2010	09h 29m 54.23s	+18° 45' 08.3"	1.6277934	0.7388551	6.14	141.5	12.7	-0.8	0.963	22.1	19.39	2.57	10.10
02/01/2010	09h 29m 18.81s	+18° 50' 30.2"	1.6286191	0.7337445	6.10	142.6	12.8	-0.8	0.965	21.5	19.34	2.52	10.06
03/01/2010	09h 28m 40.05s	+18° 56' 05.5"	1.6294367	0.7287783	6.06	143.8	12.8	-0.8	0.967	20.9	19.29	2.48	10.02
04/01/2010	09h 27m 57.97s	+19° 01' 54.0"	1.6302461	0.7239608	6.02	145.0	12.9	-0.8	0.969	20.2	19.24	2.43	9.97
05/01/2010	09h 27m 12.57s	+19° 07' 55.2"	1.6310474	0.7192965	5.98	146.2	13.0	-0.8	0.971	19.6	19.19	2.38	9.93
06/01/2010	09h 26m 23.88s	+19° 14' 08.7"	1.6318404	0.7147900	5.94	147.5	13.1	-0.9	0.973	18.9	19.14	2.34	9.49
07/01/2010	09h 25m 31.91s	+19° 20' 33.8"	1.6326251	0.7104460	5.91	148.7	13.2	-0.9	0.975	18.2	19.08	2.29	9.44
08/01/2010	09h 24m 36.71s	+19° 27' 10.0"	1.6334016	0.7062692	5.87	149.9	13.3	-0.9	0.977	17.6	19.03	2.24	9.40
09/01/2010	09h 23m 38.31s	+19° 33' 56.7"	1.6341697	0.7022643	5.84	151.2	13.3	-0.9	0.979	16.9	18.58	2.19	9.36
10/01/2010	09h 22m 36.78s	+19° 40' 53.2"	1.6349294	0.6984358	5.81	152.5	13.4	-1	0.980	16.1	18.52	2.14	9.31
11/01/2010	09h 21m 32.18s	+19° 47' 58.6"	1.6356807	0.6947883	5.78	153.7	13.5	-1	0.982	15.4	18.47	2.09	9.27
12/01/2010	09h 20m 24.57s	+19° 55' 12.3"	1.6364235	0.6913262	5.75	155.0	13.5	-1	0.984	14.7	18.41	2.04	9.22
13/01/2010	09h 19m 14.05s	+20° 02' 33.3"	1.6371578	0.6880539	5.72	156.3	13.6	-1	0.985	14.0	18.35	1.59	9.17
14/01/2010	09h 18m 00.69s	+20° 10' 00.8"	1.6378836	0.6849753	5.70	157.6	13.7	-1.1	0.987	13.2	18.30	1.54	9.13
15/01/2010	09h 16m 44.61s	+20° 17' 33.8"	1.6386008	0.6820945	5.67	158.9	13.7	-1.1	0.988	12.5	18.24	1.49	9.08
16/01/2010	09h 15m 25.92s	+20° 25' 11.4"	1.6393093	0.6794151	5.65	160.3	13.8	-1.1	0.990	11.7	18.18	1.43	9.04
17/01/2010	09h 14m 04.74s	+20° 32' 52.5"	1.6400092	0.6769407	5.63	161.6	13.8	-1.1	0.991	10.9	18.12	1.38	8.59
18/01/2010	09h 12m 41.19s	+20° 40' 36.0"	1.6407005	0.6746744	5.61	162.9	13.9	-1.1	0.992	10.2	18.06	1.33	8.54
19/01/2010	09h 11m 15.43s	+20° 48' 21.1"	1.6413830	0.6726194	5.59	164.2	13.9	-1.1	0.993	9.4	18.00	1.28	8.49
20/01/2010	09h 09m 47.60s	+20° 56' 06.5"	1.6420567	0.6707782	5.58	165.5	14.0	-1.2	0.994	8.6	17.54	1.22	8.44
21/01/2010	09h 08m 17.85s	+21° 03' 51.2"	1.6427216	0.6691534	5.57	166.8	14.0	-1.2	0.995	7.8	17.48	1.17	8.40
22/01/2010	09h 06m 46.36s	+21° 11' 34.2"	1.6433777	0.6677472	5.55	168.1	14.0	-1.2	0.996	7.1	17.42	1.11	8.35
23/01/2010	09h 05m 13.29s	+21° 19' 14.4"	1.6440250	0.6665614	5.54	169.4	14.0	-1.2	0.997	6.3	17.36	1.06	8.30
24/01/2010	09h 03m 38.82s	+21° 26' 50.8"	1.6446633	0.6655976	5.54	170.6	14.1	-1.2	0.998	5.6	17.30	1.00	8.25
25/01/2010	09h 02m 03.14s	+21° 34' 22.3"	1.6452927	0.6648572	5.53	171.8	14.1	-1.2	0.998	4.9	17.24	0.55	8.20
26/01/2010	09h 00m 26.42s	+21° 41' 48.0"	1.6459132	0.6643409	5.53	173.0	14.1	-1.3	0.999	4.2	17.18	0.49	8.15
27/01/2010	08h 58m 48.85s	+21° 49' 06.9"	1.6465247	0.6640497	5.52	174.0	14.1	-1.3	0.999	3.6	17.12	0.44	8.10
28/01/2010	08h 57m 10.62s	+21° 56' 18.3"	1.6471271	0.6639838	5.52	174.8	14.1	-1.3	0.999	3.1	17.06	0.38	8.05
29/01/2010	08h 55m 31.91s	+22° 03' 21.2"	1.6477205	0.6641435	5.52	175.3	14.1	-1.3	0.999	2.8	17.00	0.33	8.00
30/01/2010	08h 53m 52.91s	+22° 10' 14.8"	1.6483049	0.6645288	5.53	175.4	14.1	-1.3	0.999	2.7	16.54	0.27	7.55
31/01/2010	08h 52m 13.81s	+22° 16' 58.4"	1.6488801	0.6651397	5.53	175.1	14.1	-1.3	0.999	2.9	16.48	0.21	7.50
01/02/2010	08h 50m 34.78s	+22° 23' 31.3"	1.6494462	0.6659759	5.54	174.5	14.1	-1.3	0.999	3.3	16.41	0.16	7.45
02/02/2010	08h 48m 56.03s	+22° 29' 52.7"	1.6500031	0.6670370	5.55	173.6	14.0	-1.3	0.999	3.8	16.35	0.10	7.39
03/02/2010	08h 47m 17.74s	+22° 36' 02.0"	1.6505508	0.6683227	5.56	172.5	14.0	-1.2	0.998	4.4	16.29	0.05	7.34
04/02/2010	08h 45m 40.10s	+22° 41' 58.7"	1.6510893	0.6698321	5.57	171.4	14.0	-1.2	0.998	5.1	16.23	23.54	7.29
05/02/2010	08h 44m 03.31s	+22° 47' 42.1"	1.6516186	0.6715645	5.59	170.2	13.9	-1.2	0.997	5.8	16.17	23.48	7.24
06/02/2010	08h 42m 27.55s	+22° 53' 11.8"	1.6521386	0.6735186	5.60	168.9	13.9	-1.2	0.997	6.6	16.12	23.43	7.19
07/02/2010	08h 40m 53.01s	+22° 58' 27.3"	1.6526493	0.6756931	5.62	167.7	13.9	-1.2	0.996	7.3	16.06	23.37	7.14
08/02/2010	08h 39m 19.87s	+23° 03' 28.2"	1.6531507	0.6780861	5.64	166.4	13.8	-1.1	0.995	8.1	16.00	23.32	7.09
09/02/2010	08h 37m 48.31s	+23° 08' 14.1"	1.6536427	0.6806957	5.66	165.1	13.8	-1.1	0.994	8.8	15.54	23.26	7.04
10/02/2010	08h 36m 18.49s	+23° 12' 44.9"	1.6541254	0.6835195	5.68	163.8	13.7	-1.1	0.993	9.6	15.48	23.21	6.59
11/02/2010	08h 34m 50.59s	+23° 17' 00.2"	1.6545987	0.6865551	5.71	162.5	13.6	-1.1	0.992	10.3	15.43	23.16	6.54
12/02/2010	08h 33m 24.76s	+23° 20' 59.9"	1.6550625	0.6897995	5.74	161.2	13.6	-1.1	0.991	11.1	15.37	23.10	6.49
13/02/2010	08h 32m 01.15s	+23° 24' 43.9"	1.6555170	0.6932498	5.77	159.9	13.5	-1	0.989	11.8	15.31	23.05	6.44
14/02/2010	08h 30m 39.90s	+23° 28' 11.9"	1.6559619	0.6969026	5.80	158.6	13.4	-1	0.988	12.6	15.26	23.00	6.39
15/02/2010	08h 29m 21.15s	+23° 31' 24.2"	1.6563974	0.7007545	5.83	157.3	13.4	-1	0.987	13.3	15.21	22.55	6.34
16/02/2010	08h 28m 05.02s	+23° 34' 20.5"	1.6568234	0.7048018	5.86	156.0	13.3	-0.9	0.985	14.0	15.15	22.49	6.29
17/02/2010	08h 26m 51.62s	+23° 37' 01.1"	1.6572399	0.7090405	5.90	154.8	13.2	-0.9	0.984	14.7	15.10	22.44	6.24
18/02/2010	08h 25m 41.07s	+23° 39' 26.0"	1.6576468	0.7134667	5.93	153.5	13.1	-0.9	0.982	15.4	15.05	22.39	6.19
19/02/2010	08h 24m 33.45s	+23° 41' 35.4"	1.6580442	0.7180762	5.97	152.3	13.0	-0.9	0.980	16.1	14.59	22.34	6.14
20/02/2010	08h 23m 28.85s	+23° 43' 29.4"	1.6584320	0.7228646	6.01	151.0	13.0	-0.8	0.979	16.8	14.54	22.29	6.09
21/02/2010	08h 22m 27.35s	+23° 45' 08.2"	1.6588102	0.7278276	6.05	149.8	12.9	-0.8	0.977	17.5	14.49	22.24	6.04
22/02/2010	08h 21m 29.01s	+23° 46' 32.2"	1.6591788	0.7329608	6.10	148.6	12.8	-0.8	0.975	18.1	14.44	22.19	6.00
23/02/2010	08h 20m 33.88s	+23° 47' 41.6"	1.6595377	0.7382595	6.14	147.4	12.7	-0.8	0.973	18.8	14.39	22.15	5.55
24/02/2010	08h 19m 42.00s	+23° 48' 36.8"	1.6598870	0.7437194	6.19	146.2	12.6	-0.8	0.972	19.4	14.35	22.10	5.50
25/02/2010	08h 18m 53.40s	+23° 49' 18.0"	1.6602267	0.7493358	6.23	145.0	12.5	-0.7	0.970	20.0	14.30	22.05	5.45
26/02/2010	08h 18m 08.11s	+23° 49' 45.5"	1.6605566	0.7551043	6.28	143.8	12.4	-0.7	0.968	20.6	14.25	22.01	5.41
27/02/2010	08h 17m 26.13s	+23° 49' 59.8"	1.6608769	0.7610207	6.33	142.7	12.3	-0.7	0.966	21.2	14.21	21.56	5.36
28/02/2010	08h 16m 47.48s	+23° 50' 01.1"	1.6611874	0.7670807	6.38	141.5	12.2	-0.6	0.964	21.8	14.16	21.52	5.32
01/03/2010	08h 16m 12.15s	+23° 49' 49.7"	1.6614883	0.7732804	6.43	140.4	12.1	-0.6	0.963	22.3	14.12	21.47	5.27
02/03/2010	08h 15m 40.15s	+23° 49' 26.1"	1.6617793	0.7796158	6.48	139.3	12.0	-0.6	0.961	22.9	14.07	21.43	5.23
03/03/2010	08h 15m 11.46s	+23° 48' 50.3"	1.6620607	0.7860833	6.54	138.2	11.9	-0.6	0.959	23.4	14.03	21.38	5.18
04/03/2010	08h 14m 46.09s	+23° 48' 02.9"	1.6623322	0.7926792	6.59	137.1	11.8	-0.5	0.957	23.9	13.59	21.34	5.14
05/03/2010	08h 14m 24.02s	+23° 47' 04.0"	1.6625940	0.7993998	6.65	136.1	11.7	-0.5	0.955	24.5	13.54	21.30	5.09
06/03/2010	08h 14m 05.23s	+23° 45' 53.9"	1.6628460	0.8062415	6.71	135.0	11.6	-0.5	0.953	25.0	13.50	21.26	5.05
07/03/2010	08h 13m 49.71s	+23° 44' 32.9"	1.6630882	0.8132007	6.76	134.0	11.5	-0.5	0.952	25.4	13.46	21.21	5.01
08/03/2010	08h 13m 37.44s	+23° 43' 01.3"	1.6633206	0.8202737	6.82	132.9	11.4	-0.4	0.950	25.9	13.42	21.17	4.56
09/03/2010	08h 13m 28.39s	+23° 41' 19.2"	1.6635431	0.8274569	6.88	131.9	11.3	-0.4	0.948	26.4	13.38	21.13	4.52
10/03/2010	08h 13m 22.52s	+23° 39' 27.0"	1.6637558	0.8347465	6.94	130.9	11.2	-0.4	0.946	26.8	13.34	21.09	4.48
11/03/2010	08h 13m 19.82s	+23° 37' 24.8"	1.6639587	0.8421390	7.00	129.9	11.1	-0.3	0.944	27.3	13.31	21.05	4.44
12/03/2010	08h 13m 20.24s	+23° 35' 12.8"	1.6641517	0.8496307	7.07	128.9	11.0	-0.3	0.943	27.7	13.27	21.01	4.40
13/03/2010	08h 13m 23.75s	+23° 32' 51.3"	1.6643348	0.8572178	7.13	127.9	10.9	-0.3	0.941	28.1	13.23	20.58	4.36
14/03/2010	08h 13m 30.30s	+23° 30' 20.4"	1.6645081	0.8648968	7.19	127.0	10.8	-0.3	0.939	28.5	13.20	20.5	

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle°	Rise	Transit	Set
09/04/2010	08h 31m 26.29s	+21° 38' 05.4"	1.6655316	1.0862281	9.03	105.8	8.6	0.3	0.908	35.4	12.04	19.30	2.59
10/04/2010	08h 32m 35.86s	+21° 32' 09.9"	1.6654368	1.0952561	9.11	105.1	8.6	0.3	0.907	35.5	12.02	19.28	2.56
11/04/2010	08h 33m 47.07s	+21° 26' 07.7"	1.6653321	1.1043035	9.18	104.4	8.5	0.4	0.906	35.6	12.00	19.25	2.53
12/04/2010	08h 34m 59.90s	+21° 19' 58.7"	1.6652175	1.1133683	9.26	103.7	8.4	0.4	0.906	35.8	11.58	19.22	2.49
13/04/2010	08h 36m 14.30s	+21° 13' 42.8"	1.6650930	1.1224487	9.34	103.0	8.3	0.4	0.905	35.9	11.55	19.19	2.46
14/04/2010	08h 37m 30.24s	+21° 07' 20.2"	1.6649585	1.1315428	9.41	102.4	8.3	0.4	0.904	36.0	11.53	19.17	2.43
15/04/2010	08h 38m 47.68s	+21° 00' 50.8"	1.6648142	1.1406486	9.49	101.7	8.2	0.5	0.904	36.2	11.51	19.14	2.40
16/04/2010	08h 40m 06.58s	+20° 54' 14.6"	1.6646600	1.1497643	9.56	101.1	8.1	0.5	0.903	36.3	11.49	19.12	2.37
17/04/2010	08h 41m 26.91s	+20° 47' 31.6"	1.6644958	1.1588880	9.64	100.4	8.1	0.5	0.903	36.4	11.47	19.09	2.34
18/04/2010	08h 42m 48.62s	+20° 40' 42.0"	1.6643219	1.1680179	9.71	99.8	8.0	0.5	0.902	36.5	11.45	19.06	2.31
19/04/2010	08h 44m 11.67s	+20° 33' 45.6"	1.6641380	1.1771521	9.79	99.1	8.0	0.5	0.902	36.6	11.43	19.04	2.28
20/04/2010	08h 45m 36.03s	+20° 26' 42.7"	1.6639443	1.1862890	9.87	98.5	7.9	0.5	0.901	36.7	11.41	19.01	2.25
21/04/2010	08h 47m 01.66s	+20° 19' 33.0"	1.6637407	1.1954269	9.94	97.9	7.8	0.6	0.901	36.7	11.39	18.99	2.22
22/04/2010	08h 48m 28.51s	+20° 12' 16.9"	1.6635273	1.2045642	10.02	97.3	7.8	0.6	0.900	36.8	11.37	18.96	2.19
23/04/2010	08h 49m 56.54s	+20° 04' 54.1"	1.6633040	1.2136996	10.09	96.7	7.7	0.6	0.900	36.9	11.35	18.94	2.16
24/04/2010	08h 51m 25.73s	+19° 57' 24.9"	1.6630709	1.2228318	10.17	96.1	7.7	0.6	0.900	37.0	11.33	18.91	2.13
25/04/2010	08h 52m 56.03s	+19° 49' 49.1"	1.6628280	1.2319596	10.25	95.5	7.6	0.6	0.899	37.0	11.31	18.89	2.10
26/04/2010	08h 54m 27.40s	+19° 42' 06.9"	1.6625754	1.2410821	10.32	94.9	7.5	0.6	0.899	37.1	11.29	18.87	2.07
27/04/2010	08h 55m 59.83s	+19° 34' 18.1"	1.6623129	1.2501983	10.40	94.3	7.5	0.7	0.899	37.1	11.27	18.84	2.04
28/04/2010	08h 57m 33.28s	+19° 26' 22.9"	1.6620406	1.2593074	10.47	93.7	7.4	0.7	0.898	37.2	11.26	18.82	2.01
29/04/2010	08h 59m 07.72s	+19° 18' 21.3"	1.6617586	1.2684087	10.55	93.1	7.4	0.7	0.898	37.2	11.24	18.80	1.98
30/04/2010	09h 00m 43.12s	+19° 10' 13.3"	1.6614668	1.2775015	10.63	92.5	7.3	0.7	0.898	37.3	11.22	18.37	1.55
01/05/2010	09h 02m 19.47s	+19° 01' 58.8"	1.6611653	1.2865851	10.70	92.0	7.3	0.7	0.898	37.3	11.20	18.35	1.52
02/05/2010	09h 03m 56.72s	+18° 53' 37.9"	1.6608541	1.2956587	10.78	91.4	7.2	0.7	0.898	37.3	11.19	18.33	1.49
03/05/2010	09h 05m 34.86s	+18° 45' 10.6"	1.6605331	1.3047215	10.85	90.9	7.2	0.8	0.897	37.4	11.17	18.30	1.46
04/05/2010	09h 07m 13.87s	+18° 36' 36.9"	1.6602025	1.3137727	10.93	90.3	7.1	0.8	0.897	37.4	11.15	18.28	1.43
05/05/2010	09h 08m 53.72s	+18° 27' 56.8"	1.6598622	1.3228116	11.00	89.7	7.1	0.8	0.897	37.4	11.14	18.26	1.40
06/05/2010	09h 10m 34.39s	+18° 19' 10.3"	1.6595122	1.3318370	11.08	89.2	7.0	0.8	0.897	37.4	11.12	18.23	1.37
07/05/2010	09h 12m 15.85s	+18° 10' 17.4"	1.6591526	1.3408483	11.15	88.7	7.0	0.8	0.897	37.4	11.10	18.21	1.35
08/05/2010	09h 13m 58.10s	+18° 01' 18.1"	1.6587834	1.3498444	11.23	88.1	6.9	0.8	0.897	37.4	11.09	18.19	1.32
09/05/2010	09h 15m 41.12s	+17° 52' 12.3"	1.6584045	1.3588243	11.30	87.6	6.9	0.8	0.897	37.5	11.07	18.17	1.29
10/05/2010	09h 17m 24.88s	+17° 43' 00.1"	1.6580161	1.3677872	11.38	87.1	6.8	0.8	0.897	37.5	11.06	18.15	1.26
11/05/2010	09h 19m 09.36s	+17° 33' 41.5"	1.6576180	1.3767319	11.45	86.5	6.8	0.9	0.897	37.5	11.04	18.12	1.23
12/05/2010	09h 20m 54.56s	+17° 24' 16.6"	1.6572105	1.3856575	11.52	86.0	6.8	0.9	0.897	37.4	11.03	18.10	1.20
13/05/2010	09h 22m 40.45s	+17° 14' 45.2"	1.6567933	1.3945628	11.60	85.5	6.7	0.9	0.897	37.4	11.01	18.08	1.18
14/05/2010	09h 24m 27.01s	+17° 05' 07.5"	1.6563667	1.4034468	11.67	85.0	6.7	0.9	0.897	37.4	10.59	18.06	1.15
15/05/2010	09h 26m 14.24s	+16° 55' 23.4"	1.6559306	1.4123084	11.75	84.5	6.6	0.9	0.897	37.4	10.58	18.04	1.12
16/05/2010	09h 28m 02.10s	+16° 45' 33.1"	1.6554850	1.4211465	11.82	84.0	6.6	0.9	0.897	37.4	10.57	18.02	1.09
17/05/2010	09h 29m 50.59s	+16° 35' 36.5"	1.6550299	1.4299600	11.89	83.5	6.6	0.9	0.897	37.4	10.55	17.99	1.06
18/05/2010	09h 31m 39.67s	+16° 25' 33.7"	1.6545654	1.4387478	11.97	83.0	6.5	1	0.897	37.4	10.54	17.97	1.03
19/05/2010	09h 33m 29.34s	+16° 15' 24.8"	1.6540916	1.4475090	12.04	82.5	6.5	1	0.898	37.3	10.52	17.95	1.01
20/05/2010	09h 35m 19.56s	+16° 05' 09.8"	1.6536083	1.4562428	12.11	82.0	6.4	1	0.898	37.3	10.51	17.93	0.98
21/05/2010	09h 37m 10.33s	+15° 54' 48.8"	1.6531156	1.4649485	12.18	81.5	6.4	1	0.898	37.3	10.49	17.91	0.95
22/05/2010	09h 39m 01.61s	+15° 44' 21.8"	1.6526136	1.4736253	12.26	81.0	6.4	1	0.898	37.2	10.48	17.89	0.92
23/05/2010	09h 40m 53.41s	+15° 33' 48.8"	1.6521024	1.4822728	12.33	80.6	6.3	1	0.898	37.2	10.47	17.87	0.90
24/05/2010	09h 42m 45.69s	+15° 23' 09.9"	1.6515818	1.4908905	12.40	80.1	6.3	1	0.899	37.2	10.45	17.85	0.87
25/05/2010	09h 44m 38.46s	+15° 12' 25.1"	1.6510519	1.4994782	12.47	79.6	6.2	1	0.899	37.1	10.44	17.83	0.84
26/05/2010	09h 46m 31.69s	+15° 01' 34.5"	1.6505128	1.5080355	12.54	79.1	6.2	1.1	0.899	37.1	10.43	17.81	0.81
27/05/2010	09h 48m 25.38s	+14° 50' 38.1"	1.6499645	1.5165623	12.61	78.7	6.2	1.1	0.899	37.0	10.41	17.79	0.78
28/05/2010	09h 50m 19.50s	+14° 39' 36.0"	1.6494070	1.5250584	12.68	78.2	6.1	1.1	0.899	37.0	10.40	17.77	0.75
29/05/2010	09h 52m 14.06s	+14° 28' 28.1"	1.6488404	1.5335235	12.75	77.7	6.1	1.1	0.900	36.9	10.39	17.75	0.72
30/05/2010	09h 54m 09.04s	+14° 17' 14.6"	1.6482646	1.5419574	12.82	77.3	6.1	1.1	0.900	36.9	10.38	17.73	0.69
31/05/2010	09h 56m 04.42s	+14° 05' 55.4"	1.6476797	1.5503599	12.89	76.8	6.0	1.1	0.900	36.8	10.36	17.71	0.67
01/06/2010	09h 58m 00.20s	+13° 54' 30.7"	1.6470858	1.5587306	12.96	76.4	6.0	1.1	0.901	36.7	10.35	17.69	0.64
02/06/2010	09h 59m 56.38s	+13° 43' 00.3"	1.6464828	1.5670692	13.03	75.9	6.0	1.1	0.901	36.7	10.34	17.67	0.62
03/06/2010	10h 01m 52.94s	+13° 31' 24.4"	1.6458708	1.5753754	13.10	75.5	5.9	1.1	0.901	36.6	10.32	17.65	0.59
04/06/2010	10h 03m 49.87s	+13° 19' 43.0"	1.6452498	1.5836486	13.17	75.0	5.9	1.1	0.902	36.6	10.31	17.63	0.56
05/06/2010	10h 05m 47.18s	+13° 07' 56.0"	1.6446199	1.5918884	13.24	74.6	5.9	1.1	0.902	36.5	10.30	17.61	0.54
06/06/2010	10h 07m 44.86s	+12° 56' 03.6"	1.6439810	1.6000944	13.31	74.1	5.9	1.2	0.902	36.4	10.29	17.59	0.51
07/06/2010	10h 09m 42.89s	+12° 44' 05.8"	1.6433333	1.6082659	13.38	73.7	5.8	1.2	0.903	36.4	10.28	17.57	0.48
08/06/2010	10h 11m 41.28s	+12° 32' 02.5"	1.6426761	1.6164026	13.44	73.3	5.8	1.2	0.903	36.3	10.26	17.55	0.45
09/06/2010	10h 13m 40.03s	+12° 19' 53.8"	1.6420112	1.6245036	13.51	72.8	5.8	1.2	0.903	36.2	10.25	17.53	0.42
10/06/2010	10h 15m 39.12s	+12° 07' 39.8"	1.6413370	1.6325685	13.58	72.4	5.7	1.2	0.904	36.1	10.24	17.51	0.39
11/06/2010	10h 17m 38.56s	+11° 55' 20.5"	1.6406541	1.6405964	13.65	72.0	5.7	1.2	0.904	36.0	10.23	17.49	0.36
12/06/2010	10h 19m 38.33s	+11° 42' 55.9"	1.6399624	1.6485867	13.71	71.6	5.7	1.2	0.905	36.0	10.22	17.47	0.33
13/06/2010	10h 21m 38.43s	+11° 30' 26.2"	1.6392620	1.6565387	13.78	71.1	5.7	1.2	0.905	35.9	10.21	17.45	0.30
14/06/2010	10h 23m 38.86s	+11° 17' 51.4"	1.6385530	1.6644515	13.84	70.7	5.6	1.2	0.906	35.8	10.20	17.43	0.27
15/06/2010	10h 25m 39.60s	+11° 05' 11.6"	1.6378353	1.6723245	13.91	70.3	5.6	1.2	0.906	35.7	10.18	17.41	0.24
16/06/2010	10h 27m 40.64s	+10° 52' 26.9"	1.6371091	1.6801571	13.97	69.9	5.6	1.2	0.906	35.6	10.17	17.39	0.21
17/06/2010	10h 29m 41.97s	+10° 39' 37.2"	1.6363744	1.6879486	14.04	69.5	5.6	1.3	0.907	35.5	10.16	17.37	0.18
18/06/2010	10h 31m 43.60s	+10° 26' 42.8"	1.6356311	1.6956988	14.10	69.0	5.5	1.3	0.907	35.5	10.15	17.35	0.15
19/06/2010	10h 33m 45.50s	+10° 13' 43.7"	1.6348794	1.7034071	14.17	68.6	5.5	1.3	0.908	35.4	10.14	17.33	0.12
20/06/2010	10h 35m 47.69s	+10° 00' 39.9"	1.6341193	1.7110736	14.23	68.2	5.5	1.3	0.908	35.3	10.13	17.31	0.09
21/06/2010	10h 37m 50.15s	+09° 47' 31.4"	1.63335										

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle°	Rise	Transit	Set
22/07/2010	11h 43m 14.12s	+02° 27' 47.4"	1.6056128	1.9336569	16.08	56.1	4.8	1.4	0.926	31.7	9.42	15.53	22.04
23/07/2010	11h 45m 24.87s	+02° 12' 45.8"	1.6046005	1.9398585	16.13	55.7	4.8	1.5	0.926	31.5	9.41	15.51	22.01
24/07/2010	11h 47m 35.88s	+01° 57' 42.1"	1.6035814	1.9460132	16.19	55.4	4.8	1.5	0.927	31.4	9.40	15.50	21.58
25/07/2010	11h 49m 47.15s	+01° 42' 36.1"	1.6025557	1.9521213	16.24	55.0	4.8	1.5	0.927	31.3	9.39	15.48	21.56
26/07/2010	11h 51m 58.70s	+01° 27' 28.1"	1.6015234	1.9581829	16.29	54.7	4.8	1.5	0.928	31.2	9.39	15.46	21.53
27/07/2010	11h 54m 10.53s	+01° 12' 18.1"	1.6004845	1.9641981	16.34	54.3	4.8	1.5	0.928	31.0	9.38	15.44	21.50
28/07/2010	11h 56m 22.63s	+00° 57' 06.2"	1.5994391	1.9701671	16.39	54.0	4.8	1.5	0.929	30.9	9.37	15.43	21.48
29/07/2010	11h 58m 35.02s	+00° 41' 52.4"	1.5983872	1.9760900	16.44	53.6	4.7	1.5	0.930	30.8	9.36	15.41	21.45
30/07/2010	12h 00m 47.69s	+00° 26' 36.8"	1.5973290	1.9819668	16.48	53.3	4.7	1.5	0.930	30.6	9.35	15.39	21.43
31/07/2010	12h 03m 00.66s	+00° 11' 19.5"	1.5962645	1.9877975	16.53	52.9	4.7	1.5	0.931	30.5	9.34	15.37	21.40
01/08/2010	12h 05m 13.94s	-00° 03' 59.4"	1.5951937	1.9935822	16.58	52.6	4.7	1.5	0.931	30.3	9.34	15.36	21.37
02/08/2010	12h 07m 27.52s	-00° 19' 19.9"	1.5941168	1.9993207	16.63	52.2	4.7	1.5	0.932	30.2	9.33	15.34	21.35
03/08/2010	12h 09m 41.41s	-00° 34' 41.8"	1.5930337	2.0050130	16.68	51.9	4.7	1.5	0.933	30.1	9.32	15.32	21.32
04/08/2010	12h 11m 55.62s	-00° 50' 05.2"	1.5919446	2.0106590	16.72	51.5	4.7	1.5	0.933	29.9	9.31	15.31	21.29
05/08/2010	12h 14m 10.16s	-01° 05' 29.9"	1.5908496	2.0162583	16.77	51.2	4.6	1.5	0.934	29.8	9.31	15.29	21.27
06/08/2010	12h 16m 25.03s	-01° 20' 55.9"	1.5897486	2.0218108	16.82	50.9	4.6	1.5	0.934	29.7	9.30	15.27	21.24
07/08/2010	12h 18m 40.24s	-01° 36' 23.0"	1.5886418	2.0273162	16.86	50.5	4.6	1.5	0.935	29.5	9.29	15.26	21.22
08/08/2010	12h 20m 55.78s	-01° 51' 51.1"	1.5875292	2.0327740	16.91	50.2	4.6	1.5	0.936	29.4	9.28	15.24	21.19
09/08/2010	12h 23m 11.67s	-02° 07' 20.2"	1.5864109	2.0381838	16.95	49.8	4.6	1.5	0.936	29.2	9.27	15.22	21.16
10/08/2010	12h 25m 27.90s	-02° 22' 50.1"	1.5852869	2.0435453	17.00	49.5	4.6	1.5	0.937	29.1	9.27	15.20	21.14
11/08/2010	12h 27m 44.47s	-02° 38' 20.7"	1.5841575	2.0488581	17.04	49.2	4.6	1.5	0.938	29.0	9.26	15.19	21.11
12/08/2010	12h 30m 01.40s	-02° 53' 51.8"	1.5830225	2.0541218	17.08	48.8	4.6	1.5	0.938	28.8	9.25	15.17	21.09
13/08/2010	12h 32m 18.68s	-03° 09' 23.5"	1.5818821	2.0593362	17.13	48.5	4.6	1.5	0.939	28.7	9.25	15.16	21.06
14/08/2010	12h 34m 36.32s	-03° 24' 55.5"	1.5807364	2.0645012	17.17	48.2	4.5	1.5	0.939	28.5	9.24	15.14	21.03
15/08/2010	12h 36m 54.32s	-03° 40' 27.8"	1.5795854	2.0696170	17.21	47.8	4.5	1.5	0.940	28.4	9.23	15.12	21.01
16/08/2010	12h 39m 12.68s	-03° 56' 00.2"	1.5784292	2.0746836	17.26	47.5	4.5	1.5	0.941	28.2	9.22	15.11	20.58
17/08/2010	12h 41m 31.42s	-04° 11' 32.7"	1.5772679	2.0797012	17.30	47.2	4.5	1.5	0.941	28.1	9.22	15.09	20.56
18/08/2010	12h 43m 50.53s	-04° 27' 05.2"	1.5761016	2.0846702	17.34	46.9	4.5	1.5	0.942	27.9	9.21	15.07	20.53
19/08/2010	12h 46m 10.01s	-04° 42' 37.4"	1.5749303	2.0895908	17.38	46.5	4.5	1.5	0.942	27.8	9.20	15.06	20.51
20/08/2010	12h 48m 29.87s	-04° 58' 09.3"	1.5737541	2.0944634	17.42	46.2	4.5	1.5	0.943	27.6	9.20	15.04	20.48
21/08/2010	12h 50m 50.12s	-05° 13' 40.9"	1.5725731	2.0992882	17.46	45.9	4.5	1.5	0.943	27.5	9.19	15.03	20.46
22/08/2010	12h 53m 10.75s	-05° 29' 11.9"	1.5713874	2.1040656	17.50	45.5	4.5	1.5	0.944	27.4	9.18	15.01	20.43
23/08/2010	12h 55m 31.77s	-05° 44' 42.3"	1.5701970	2.1087959	17.54	45.2	4.4	1.5	0.945	27.2	9.18	14.99	20.41
24/08/2010	12h 57m 53.19s	-06° 00' 11.9"	1.5690021	2.1134793	17.58	44.9	4.4	1.5	0.945	27.1	9.17	14.98	20.38
25/08/2010	13h 00m 15.01s	-06° 15' 40.7"	1.5678026	2.1181162	17.62	44.6	4.4	1.5	0.946	26.9	9.16	14.96	20.36
26/08/2010	13h 02m 37.25s	-06° 31' 08.6"	1.5665988	2.1227068	17.65	44.3	4.4	1.5	0.946	26.8	9.16	14.95	20.33
27/08/2010	13h 04m 59.91s	-06° 46' 35.4"	1.5653906	2.1272513	17.69	43.9	4.4	1.5	0.947	26.6	9.15	14.93	20.31
28/08/2010	13h 07m 22.99s	-07° 02' 01.1"	1.5641782	2.1317499	17.73	43.6	4.4	1.5	0.948	26.5	9.15	14.92	20.28
29/08/2010	13h 09m 46.51s	-07° 17' 25.5"	1.5629617	2.1362026	17.77	43.3	4.4	1.5	0.948	26.3	9.14	14.90	20.26
30/08/2010	13h 12m 10.47s	-07° 32' 48.6"	1.5617411	2.1406097	17.80	43.0	4.4	1.5	0.949	26.2	9.13	14.88	20.23
31/08/2010	13h 14m 34.89s	-07° 48' 10.2"	1.5605164	2.1449711	17.84	42.7	4.4	1.5	0.949	26.0	9.13	14.87	20.21
01/09/2010	13h 16m 59.76s	-08° 03' 30.3"	1.5592879	2.1492869	17.88	42.3	4.4	1.5	0.950	25.8	9.12	14.85	20.18
02/09/2010	13h 19m 25.10s	-08° 18' 48.7"	1.5580556	2.1535570	17.91	42.0	4.4	1.5	0.951	25.7	9.12	14.84	20.16
03/09/2010	13h 21m 50.92s	-08° 34' 05.3"	1.5568195	2.1577814	17.95	41.7	4.3	1.5	0.951	25.5	9.11	14.82	20.13
04/09/2010	13h 24m 17.21s	-08° 49' 20.0"	1.5555798	2.1619598	17.98	41.4	4.3	1.5	0.952	25.4	9.10	14.81	20.11
05/09/2010	13h 26m 43.98s	-09° 04' 32.6"	1.5543366	2.1660920	18.02	41.1	4.3	1.5	0.952	25.2	9.10	14.79	20.08
06/09/2010	13h 29m 11.25s	-09° 19' 43.1"	1.5530899	2.1701778	18.05	40.8	4.3	1.5	0.953	25.1	9.09	14.78	20.06
07/09/2010	13h 31m 39.00s	-09° 34' 51.2"	1.5518398	2.1742168	18.08	40.5	4.3	1.5	0.953	24.9	9.09	14.76	20.04
08/09/2010	13h 34m 07.26s	-09° 49' 56.8"	1.5505864	2.1782088	18.12	40.1	4.3	1.5	0.954	24.8	9.08	14.75	20.01
09/09/2010	13h 36m 36.02s	-10° 04' 59.8"	1.5493299	2.1821534	18.15	39.8	4.3	1.5	0.955	24.6	9.08	14.74	19.99
10/09/2010	13h 39m 05.29s	-10° 20' 00.1"	1.5480702	2.1860506	18.18	39.5	4.3	1.5	0.955	24.5	9.07	14.72	19.97
11/09/2010	13h 41m 35.07s	-10° 34' 57.4"	1.5468076	2.1899002	18.21	39.2	4.3	1.5	0.956	24.3	9.07	14.71	19.94
12/09/2010	13h 44m 05.38s	-10° 49' 51.7"	1.5455420	2.1937024	18.25	38.9	4.3	1.5	0.956	24.1	9.06	14.70	19.92
13/09/2010	13h 46m 36.21s	-11° 04' 42.9"	1.5442736	2.1974573	18.28	38.6	4.3	1.5	0.957	24.0	9.06	14.68	19.89
14/09/2010	13h 49m 07.56s	-11° 19' 30.7"	1.5430025	2.2011652	18.31	38.3	4.3	1.5	0.957	23.8	9.05	14.66	19.87
15/09/2010	13h 51m 39.44s	-11° 34' 15.1"	1.5417288	2.2048265	18.34	38.0	4.3	1.5	0.958	23.7	9.05	14.65	19.85
16/09/2010	13h 54m 11.86s	-11° 48' 55.9"	1.5404525	2.2084416	18.37	37.7	4.2	1.5	0.958	23.5	9.04	14.64	19.82
17/09/2010	13h 56m 44.81s	-12° 03' 32.9"	1.5391738	2.2120108	18.40	37.4	4.2	1.5	0.959	23.4	9.04	14.62	19.80
18/09/2010	13h 59m 18.30s	-12° 18' 06.0"	1.5378928	2.2155346	18.43	37.1	4.2	1.5	0.960	23.2	9.03	14.61	19.78
19/09/2010	14h 01m 52.33s	-12° 32' 35.1"	1.5366095	2.2190133	18.46	36.8	4.2	1.5	0.960	23.0	9.03	14.59	19.76
20/09/2010	14h 04m 26.91s	-12° 46' 59.9"	1.5353241	2.2224475	18.48	36.5	4.2	1.5	0.961	22.9	9.02	14.58	19.73
21/09/2010	14h 07m 02.05s	-13° 01' 20.4"	1.5340366	2.2258374	18.51	36.2	4.2	1.5	0.961	22.7	9.02	14.57	19.71
22/09/2010	14h 09m 37.75s	-13° 15' 36.5"	1.5327473	2.2291834	18.54	35.8	4.2	1.5	0.962	22.6	9.02	14.55	19.29
23/09/2010	14h 12m 14.02s	-13° 29' 47.9"	1.5314560	2.2324860	18.57	35.5	4.2	1.5	0.962	22.4	9.01	14.54	19.27
24/09/2010	14h 14m 50.86s	-13° 43' 54.5"	1.5301631	2.2357454	18.59	35.2	4.2	1.5	0.963	22.2	9.01	14.53	19.24
25/09/2010	14h 17m 28.29s	-13° 57' 56.2"	1.5288685	2.2399621	18.62	34.9	4.2	1.5	0.963	22.1	9.00	14.51	19.22
26/09/2010	14h 20m 06.30s	-14° 11' 52.9"	1.5275724	2.2421362	18.65	34.6	4.2	1.5	0.964	21.9	9.00	14.49	19.20
27/09/2010	14h 22m 44.91s	-14° 25' 44.5"	1.5262748	2.2452681	18.67	34.3	4.2	1.5	0.964	21.8	9.00	14.09	19.18
28/09/2010	14h 25m 24.13s	-14° 39' 30.6"	1.5249759	2.2483578	18.70	34.0	4.2	1.5	0.965	21.6	8.99	14.08	19.16
29/09/2010	14h 28m 03.95s	-14° 53' 11.4"	1.5236758	2.2514057	18.73	33.7	4.2	1.5	0.965	21.4	8.99	14.06	19.13
30/09/2010	14h 30m 44.39s	-15° 06' 46.5"	1.5223746	2.2544116	18.75	33.5	4.2	1.5	0.966	21.3	8.98	14.05	19.11
01/10/2010	14h 33m 25.45s	-15° 20' 15.8"	1.5210724	2.2573758	18.77	33.2	4.2	1.5	0.966	21.1	8.98	14.04	19.09
02/10/2010	14h 36m 07.13s	-15° 33' 39.2"	1.5197693	2.2602981	18.80	32.9	4.1	1.5	0.967	20.9	8.98	14.03	19.07
03/10/2010	14h 38m 49.44s	-15°											

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Phase	Phase angle°	Rise	Transit	Set
03/11/2010	16h 08m 01.43s	-21° 32' 44.7"	1.4782638	2.3323354	19.40	23.7	4.0	1.4	0.982	15.6	8.48	13.28	18.08
04/11/2010	16h 11m 04.45s	-21° 41' 15.8"	1.4769946	2.3339707	19.41	23.4	4.0	1.4	0.982	15.5	8.48	13.28	18.07
05/11/2010	16h 14m 08.09s	-21° 49' 35.2"	1.4757285	2.3355703	19.42	23.1	4.0	1.4	0.982	15.3	8.48	13.27	18.05
06/11/2010	16h 17m 12.36s	-21° 57' 42.6"	1.4744656	2.3371343	19.44	22.8	4.0	1.4	0.983	15.1	8.47	13.26	18.04
07/11/2010	16h 20m 17.25s	-22° 05' 37.9"	1.4732060	2.3386627	19.45	22.6	4.0	1.4	0.983	15.0	8.47	13.25	18.03
08/11/2010	16h 23m 22.75s	-22° 13' 21.0"	1.4719498	2.3401557	19.46	22.3	4.0	1.4	0.983	14.8	8.47	13.24	18.01
09/11/2010	16h 26m 28.84s	-22° 20' 51.6"	1.4706972	2.3416136	19.48	22.0	4.0	1.4	0.984	14.6	8.47	13.23	18.00
10/11/2010	16h 29m 35.53s	-22° 28' 09.7"	1.4694483	2.3430368	19.49	21.7	4.0	1.4	0.984	14.4	8.46	13.22	17.58
11/11/2010	16h 32m 42.79s	-22° 35' 15.0"	1.4682032	2.3444257	19.50	21.5	4.0	1.4	0.985	14.3	8.46	13.22	17.57
12/11/2010	16h 35m 50.62s	-22° 42' 07.5"	1.4669620	2.3457808	19.51	21.2	4.0	1.4	0.985	14.1	8.46	13.21	17.56
13/11/2010	16h 38m 59.00s	-22° 48' 46.8"	1.4657249	2.3471026	19.52	20.9	4.0	1.4	0.985	13.9	8.45	13.20	17.54
14/11/2010	16h 42m 07.93s	-22° 55' 12.9"	1.4644919	2.3483917	19.53	20.6	4.0	1.4	0.986	13.8	8.45	13.19	17.53
15/11/2010	16h 45m 17.41s	-23° 01' 25.7"	1.4632633	2.3496486	19.54	20.4	4.0	1.4	0.986	13.6	8.45	13.18	17.52
16/11/2010	16h 48m 27.41s	-23° 07' 24.9"	1.4620391	2.3508739	19.55	20.1	4.0	1.4	0.986	13.4	8.44	13.18	17.51
17/11/2010	16h 51m 37.94s	-23° 13' 10.4"	1.4608195	2.3520680	19.56	19.8	4.0	1.4	0.987	13.3	8.44	13.17	17.50
18/11/2010	16h 54m 48.98s	-23° 18' 42.2"	1.4596046	2.3532316	19.57	19.6	4.0	1.4	0.987	13.1	8.44	13.16	17.48
19/11/2010	16h 58m 00.53s	-23° 23' 60.0"	1.4583945	2.3543653	19.58	19.3	4.0	1.4	0.987	12.9	8.43	13.15	17.47
20/11/2010	17h 01m 12.57s	-23° 29' 03.7"	1.4571894	2.3554694	19.59	19.0	4.0	1.4	0.988	12.8	8.43	13.15	17.46
21/11/2010	17h 04m 25.10s	-23° 33' 53.2"	1.4559894	2.3565447	19.60	18.7	4.0	1.4	0.988	12.6	8.43	13.14	17.45
22/11/2010	17h 07m 38.11s	-23° 38' 28.4"	1.4547945	2.3575915	19.61	18.5	4.0	1.4	0.988	12.4	8.42	13.13	17.44
23/11/2010	17h 10m 51.59s	-23° 42' 49.2"	1.4536050	2.3586103	19.62	18.2	4.0	1.4	0.989	12.3	8.42	13.13	17.43
24/11/2010	17h 14m 05.52s	-23° 46' 55.4"	1.4524209	2.3596016	19.62	17.9	4.0	1.3	0.989	12.1	8.42	13.12	17.42
25/11/2010	17h 17m 19.90s	-23° 50' 47.0"	1.4512425	2.3605655	19.63	17.7	4.0	1.3	0.989	11.9	8.41	13.11	17.41
26/11/2010	17h 20m 34.71s	-23° 54' 23.7"	1.4500697	2.3615025	19.64	17.4	4.0	1.3	0.990	11.8	8.41	13.10	17.40
27/11/2010	17h 23m 49.94s	-23° 57' 45.6"	1.4489028	2.3624126	19.65	17.1	4.0	1.3	0.990	11.6	8.40	13.10	17.39
28/11/2010	17h 27m 05.58s	-24° 00' 52.4"	1.4477419	2.3632959	19.66	16.9	4.0	1.3	0.990	11.4	8.40	13.09	17.38
29/11/2010	17h 30m 21.61s	-24° 03' 44.0"	1.4465871	2.3641525	19.66	16.6	4.0	1.3	0.990	11.2	8.39	13.08	17.37
30/11/2010	17h 33m 38.03s	-24° 06' 20.3"	1.4454385	2.3649824	19.67	16.3	4.0	1.3	0.991	11.1	8.39	13.08	17.37
01/12/2010	17h 36m 54.82s	-24° 08' 41.3"	1.4442962	2.3657854	19.68	16.1	4.0	1.3	0.991	10.9	8.38	13.07	17.36
02/12/2010	17h 40m 11.97s	-24° 10' 46.8"	1.4431604	2.3665616	19.68	15.8	4.0	1.3	0.991	10.7	8.38	13.06	17.35
03/12/2010	17h 43m 29.47s	-24° 12' 36.7"	1.4420313	2.3673110	19.69	15.6	4.0	1.3	0.992	10.6	8.37	13.06	17.34
04/12/2010	17h 46m 47.30s	-24° 14' 11.0"	1.4409089	2.3680334	19.69	15.3	4.0	1.3	0.992	10.4	8.37	13.05	17.33
05/12/2010	17h 50m 05.44s	-24° 15' 29.7"	1.4397933	2.3687291	19.70	15.0	4.0	1.3	0.992	10.2	8.36	13.05	17.33
06/12/2010	17h 53m 23.88s	-24° 16' 32.5"	1.4386847	2.3693982	19.71	14.8	4.0	1.3	0.992	10.1	8.36	13.04	17.32
07/12/2010	17h 56m 42.59s	-24° 17' 19.6"	1.4375833	2.3700409	19.71	14.5	4.0	1.3	0.993	9.9	8.35	13.03	17.31
08/12/2010	18h 00m 01.56s	-24° 17' 50.8"	1.4364890	2.3706575	19.72	14.3	4.0	1.3	0.993	9.7	8.35	13.03	17.31
09/12/2010	18h 03m 20.77s	-24° 18' 06.0"	1.4354022	2.3712485	19.72	14.0	4.0	1.3	0.993	9.6	8.34	13.02	17.30
10/12/2010	18h 06m 40.19s	-24° 18' 05.2"	1.4343228	2.3718143	19.73	13.7	4.0	1.3	0.993	9.4	8.33	13.01	17.29
11/12/2010	18h 09m 59.82s	-24° 17' 48.4"	1.4332511	2.3723553	19.73	13.5	4.0	1.3	0.994	9.2	8.33	13.01	17.29
12/12/2010	18h 13m 19.63s	-24° 17' 15.5"	1.4321871	2.3728722	19.73	13.2	3.9	1.3	0.994	9.1	8.32	13.00	17.28
13/12/2010	18h 16m 39.61s	-24° 16' 26.4"	1.4311310	2.3733654	19.74	13.0	3.9	1.3	0.994	8.9	8.31	13.00	17.28
14/12/2010	18h 19m 59.74s	-24° 15' 21.1"	1.4300828	2.3738356	19.74	12.7	3.9	1.3	0.994	8.7	8.31	12.59	17.27
15/12/2010	18h 23m 20.01s	-24° 13' 59.6"	1.4290428	2.3742831	19.75	12.5	3.9	1.3	0.994	8.5	8.30	12.58	17.27
16/12/2010	18h 26m 40.41s	-24° 12' 21.9"	1.4280110	2.3747087	19.75	12.2	3.9	1.3	0.995	8.4	8.29	12.58	17.26
17/12/2010	18h 30m 00.90s	-24° 10' 28.0"	1.4269876	2.3751129	19.75	12.0	3.9	1.3	0.995	8.2	8.29	12.57	17.26
18/12/2010	18h 33m 21.49s	-24° 08' 17.8"	1.4259726	2.3754963	19.76	11.7	3.9	1.3	0.995	8.0	8.28	12.57	17.25
19/12/2010	18h 36m 42.16s	-24° 05' 51.3"	1.4249663	2.3758594	19.76	11.5	3.9	1.3	0.995	7.9	8.27	12.56	17.25
20/12/2010	18h 40m 02.88s	-24° 03' 08.6"	1.4239687	2.3762028	19.76	11.2	3.9	1.3	0.995	7.7	8.26	12.55	17.25
21/12/2010	18h 43m 23.65s	-24° 00' 09.7"	1.4229799	2.3765271	19.77	11.0	3.9	1.2	0.996	7.5	8.25	12.55	17.24
22/12/2010	18h 46m 44.45s	-23° 56' 54.5"	1.4220001	2.3768326	19.77	10.7	3.9	1.2	0.996	7.4	8.24	12.54	17.24
23/12/2010	18h 50m 05.26s	-23° 53' 23.1"	1.4210294	2.3771199	19.77	10.5	3.9	1.2	0.996	7.2	8.24	12.54	17.24
24/12/2010	18h 53m 26.07s	-23° 49' 35.4"	1.4200679	2.3773892	19.77	10.2	3.9	1.2	0.996	7.0	8.23	12.53	17.23
25/12/2010	18h 56m 46.86s	-23° 45' 31.6"	1.4191157	2.3776407	19.77	10.0	3.9	1.2	0.996	6.9	8.22	12.52	17.23
26/12/2010	19h 00m 07.62s	-23° 41' 11.6"	1.4181729	2.3778745	19.78	9.7	3.9	1.2	0.997	6.7	8.21	12.52	17.23
27/12/2010	19h 03m 28.34s	-23° 36' 35.4"	1.4172397	2.3780908	19.78	9.5	3.9	1.2	0.997	6.5	8.20	12.51	17.23
28/12/2010	19h 06m 49.00s	-23° 31' 43.0"	1.4163162	2.3782894	19.78	9.2	3.9	1.2	0.997	6.4	8.19	12.51	17.22
29/12/2010	19h 10m 09.59s	-23° 26' 34.5"	1.4154025	2.3784704	19.78	9.0	3.9	1.2	0.997	6.2	8.18	12.50	17.22
30/12/2010	19h 13m 30.10s	-23° 21' 10.0"	1.4144987	2.3786336	19.78	8.7	3.9	1.2	0.997	6.0	8.17	12.49	17.22
31/12/2010	19h 16m 50.51s	-23° 15' 29.5"	1.4136048	2.3787791	19.78	8.5	3.9	1.2	0.997	5.9	8.16	12.49	17.22

A.R., Dec. = coordinate apparenti  
Distance = distanza dalla Terra in U.A.  
El. = elongazione dal Sole in °  
Mag. = magnitudine

R. = distanza dal Sole in U.A.  
Light = distanza in minuti-luce  
Diam. = diametro in "

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

A.R., Dec. = apparent coordinates  
Distance = distance from the Earth in A.U.  
El. = elongation from the Sun in °  
Mag. = magnitude

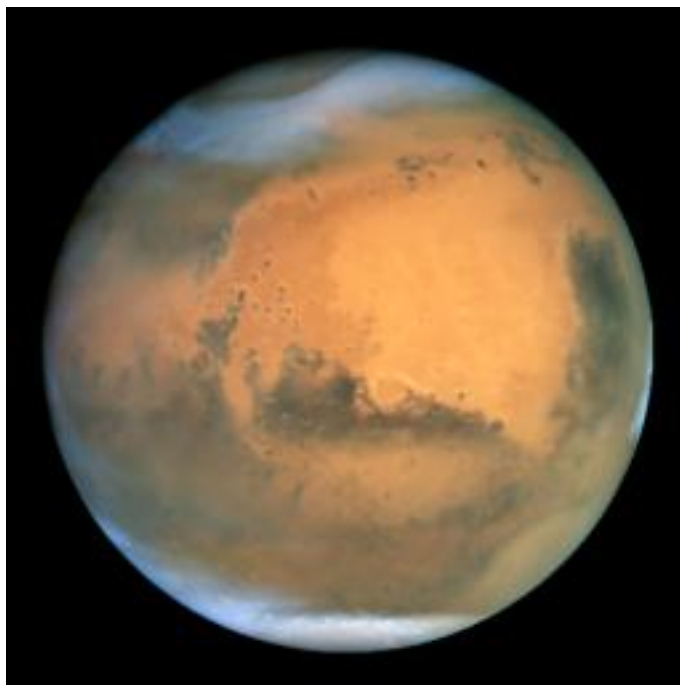
R. = distance from the Sun in A.U.  
Light = distance in minutes  
Diam. = diameter in "

Times of rising and setting of the planet for Rome (42°N, 12°E), in U.T.+1

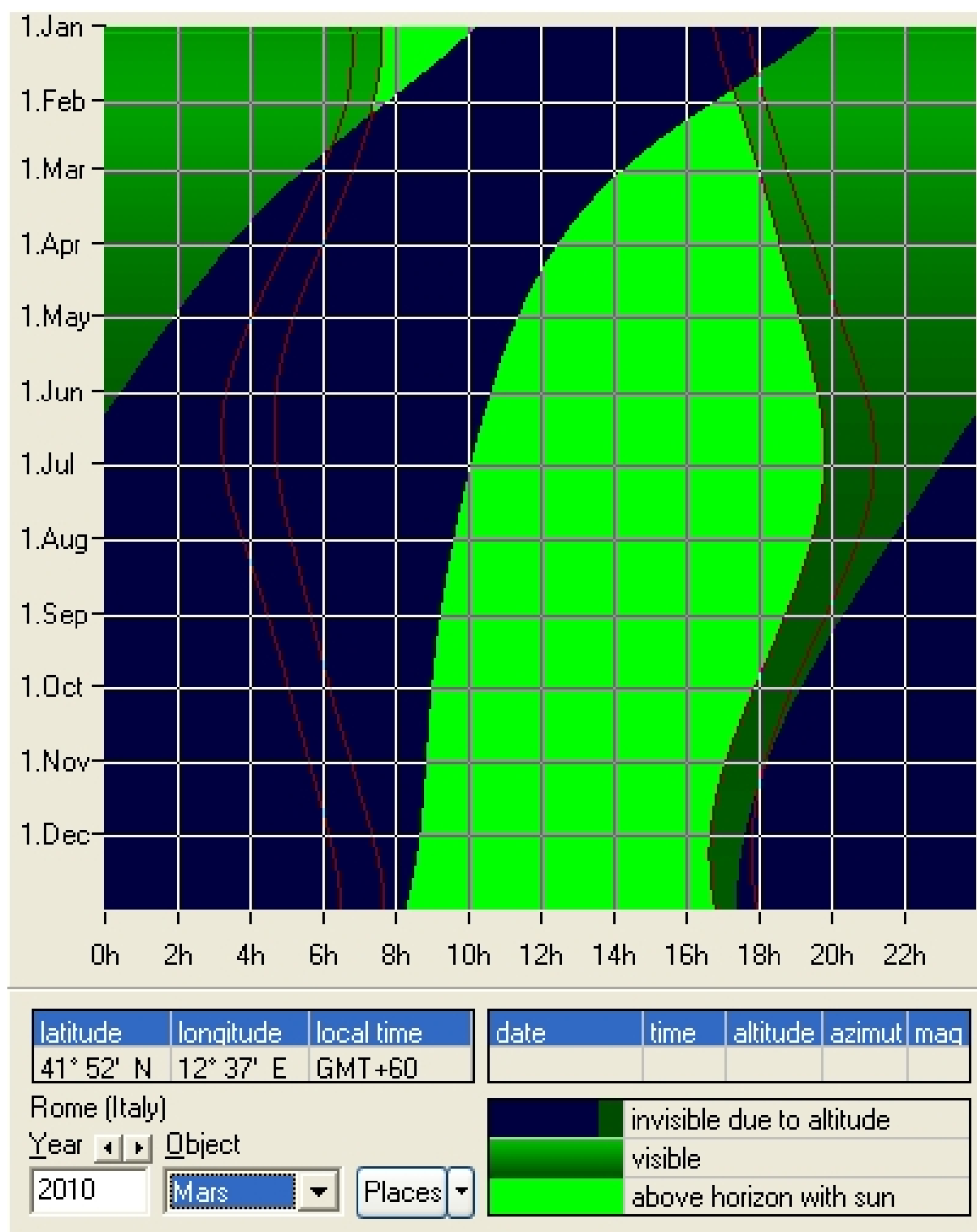
## FENOMENI DI MARTE - PHENOMENA OF MARS

Perielio - Perihelion	Questo anno non avviene - No phenomenon		
Afelio - Aphelion	30/03/2010	23.07.54	1.66594 AU
Perigeo - Perigee	27/01/2010	19.00.53	0.66398 AU
Apogeo - Apogee	Questo anno non avviene - No phenomenon		
Magnit. Max - Brightness maximum	29/01/2010	07.27.19	-1.3 mag
Magnit. Min - Brightness minimum	03/09/2010	15.14.31	1.5 mag
Opposizione - Opposition	29/01/2010	19.43.04	
Congiunzione - Conjunction	Questo anno non avviene - No phenomenon		
Moto retrogr. - Retrograde motion	Questo anno non avviene - No phenomenon		
Moto diretto - Prograde motion	11/03/2010	08.45.17	
Max ang. Fase - Maximum phase angle	10/05/2010	01.03.36	37.5 °
Min ang. Fase - Minimum phase angle	29/01/2010	20.10.34	2.7 °
Estr. lat. Terra- Extremum lat. Earth	22/07/2010	19.53.42	26.10 °
Lat. Terra zero - Lat. Earth zero	30/11/2010	21.10.00	
Estr. lat. Sole - Extremum lat. Sun	13/05/2010	04.42.01	25.19 °
Lat. Sole zero - Latitude Sun zero	12/11/2010	17.11.00	

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# VISIBILITA' DI MARTE - VISIBILITY OF MARS



Visibilità di Marte nel corso dell'anno - Visibility of Mars during the year

Le righe rosse più esterne indicano in quali periodi dell'anno il pianeta è sufficientemente distante dal Sole per poter essere osservato agevolmente. Le date esatte sono riportate nelle tabelle seguenti.

The external red lines show in what periods of the year the planet is sufficiently distant from the Sun to be able to be observed easily. The exact dates are in the following tables.

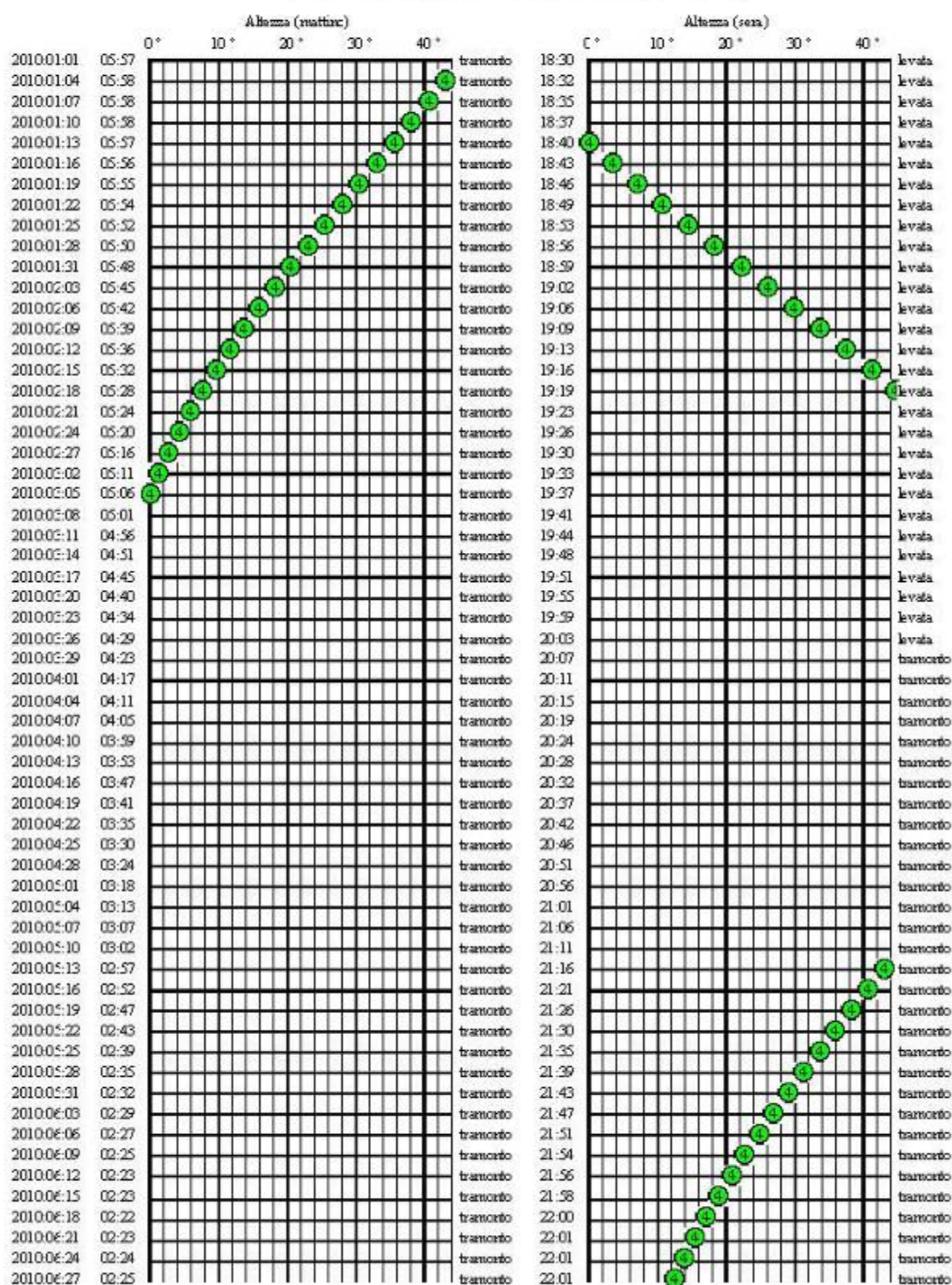


# Altezza ai crepuscoli

## di Marte

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)

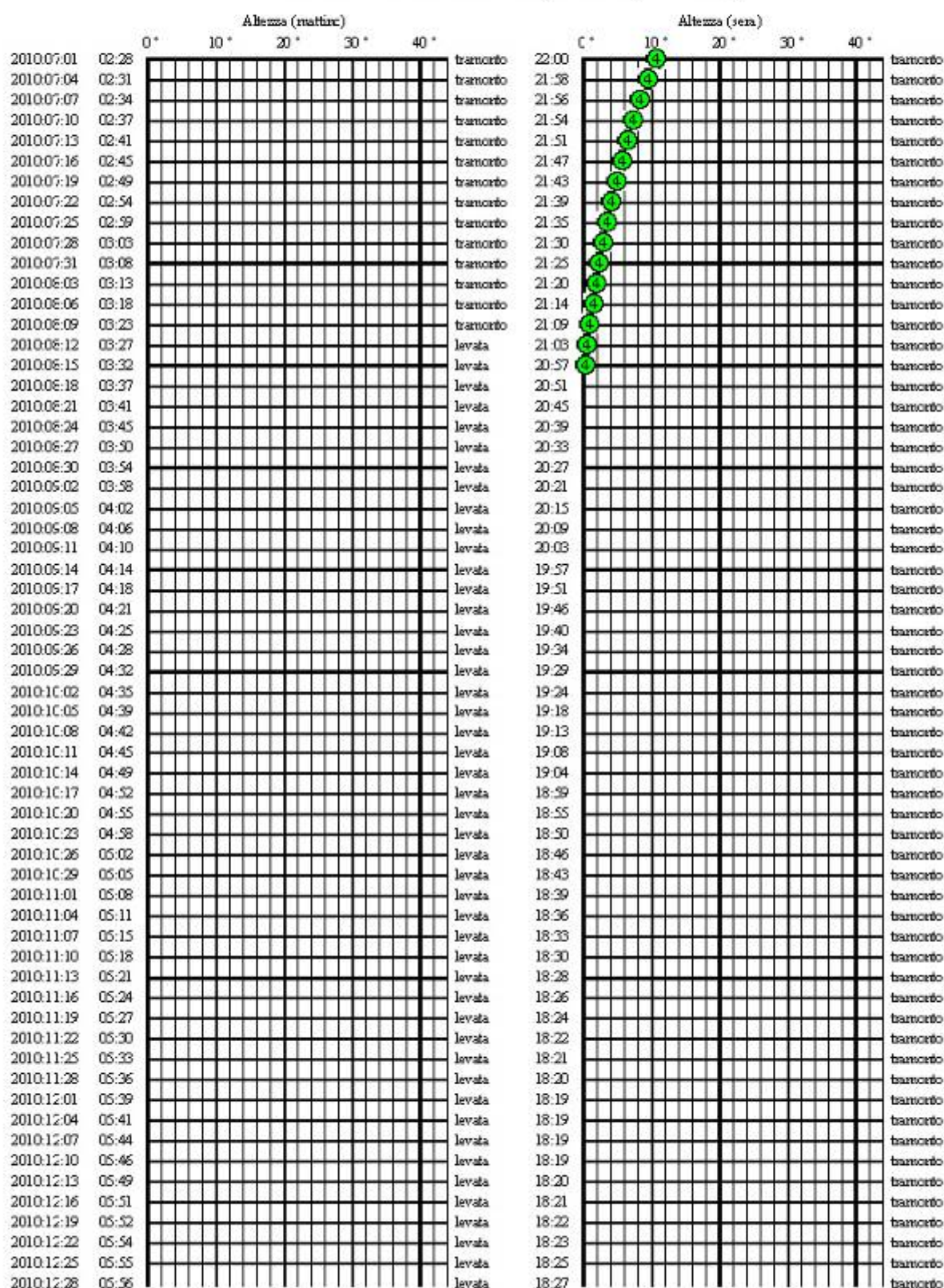


# Altezza ai crepuscoli

di Marte

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)





Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:01:01	05:57	45.4	252.9	141.7	18:30	-11.6	51.2	142.3
2010:01:04	05:58	43.0	256.3	145.3	18:32	-8.9	54.1	145.9
2010:01:07	05:58	40.6	259.5	149.0	18:35	-6.1	57.0	149.6
2010:01:10	05:58	38.1	262.6	152.7	18:37	-3.1	59.8	153.4
2010:01:13	05:57	35.6	265.7	156.6	18:40	0.2	62.6	157.3
2010:01:16	05:56	33.1	268.6	160.5	18:43	3.6	65.4	161.2
2010:01:19	05:55	30.6	271.4	164.5	18:46	7.1	68.2	165.2
2010:01:22	05:54	28.0	274.2	168.4	18:49	10.8	71.0	169.1
2010:01:25	05:52	25.5	276.9	172.1	18:53	14.5	73.7	172.7
2010:01:28	05:50	23.0	279.5	174.9	18:56	18.3	76.5	175.2
2010:01:31	05:48	20.6	282.0	175.1	18:59	22.2	79.3	174.7
2010:02:03	05:45	18.2	284.4	172.3	19:02	26.1	82.1	171.7
2010:02:06	05:42	15.9	286.7	168.7	19:06	30.0	85.0	168.0
2010:02:09	05:39	13.7	288.9	164.8	19:09	33.8	87.9	164.1
2010:02:12	05:36	11.6	291.1	160.9	19:13	37.5	90.9	160.2
2010:02:15	05:32	9.6	293.1	157.1	19:16	41.2	94.1	156.3
2010:02:18	05:28	7.7	295.0	153.3	19:19	44.8	97.4	152.5
2010:02:21	05:24	6.0	296.8	149.6	19:23	48.2	101.0	148.9
2010:02:24	05:20	4.3	298.4	146.0	19:26	51.5	104.8	145.3
2010:02:27	05:16	2.8	300.0	142.5	19:30	54.6	109.0	141.8
2010:03:02	05:11	1.3	301.4	139.1	19:33	57.5	113.5	138.5
2010:03:05	05:06	0.0	302.8	135.9	19:37	60.3	118.6	135.2
2010:03:08	05:01	-1.2	304.0	132.7	19:41	62.8	124.3	132.1
2010:03:11	04:56	-2.3	305.1	129.7	19:44	65.0	130.6	129.1
2010:03:14	04:51	-3.4	306.1	126.8	19:48	66.9	137.8	126.2
2010:03:17	04:45	-4.4	307.1	124.0	19:51	68.5	145.7	123.5
2010:03:20	04:40	-5.3	307.9	121.3	19:55	69.7	154.4	120.8
2010:03:23	04:34	-6.1	308.6	118.7	19:59	70.5	163.7	118.2
2010:03:26	04:29	-6.9	309.2	116.2	20:03	70.8	173.2	115.7
2010:03:29	04:23	-7.6	309.8	113.8	20:07	70.6	182.7	113.3
2010:04:01	04:17	-8.3	310.3	111.5	20:11	70.1	191.7	111.0
2010:04:04	04:11	-8.9	310.7	109.3	20:15	69.2	200.0	108.8
2010:04:07	04:05	-9.5	311.0	107.1	20:19	67.9	207.4	106.6
2010:04:10	03:59	-10.1	311.3	105.0	20:24	66.5	214.1	104.5
2010:04:13	03:53	-10.7	311.6	102.9	20:28	64.8	219.9	102.5
2010:04:16	03:47	-11.2	311.7	101.0	20:32	63.0	225.0	100.5
2010:04:19	03:41	-11.7	311.9	99.1	20:37	61.0	229.6	98.6
2010:04:22	03:35	-12.2	312.0	97.2	20:42	58.9	233.6	96.8
2010:04:25	03:30	-12.7	312.0	95.4	20:46	56.8	237.2	95.0
2010:04:28	03:24	-13.3	312.1	93.6	20:51	54.6	240.4	93.2
2010:05:01	03:18	-13.8	312.1	91.9	20:56	52.3	243.3	91.5
2010:05:04	03:13	-14.3	312.1	90.2	21:01	50.1	246.0	89.8
2010:05:07	03:07	-14.8	312.1	88.6	21:06	47.7	248.4	88.2
2010:05:10	03:02	-15.4	312.1	87.0	21:11	45.4	250.7	86.6
2010:05:13	02:57	-16.0	312.1	85.5	21:16	43.0	252.7	85.1
2010:05:16	02:52	-16.6	312.2	83.9	21:21	40.7	254.7	83.6
2010:05:19	02:47	-17.2	312.2	82.5	21:26	38.3	256.5	82.1
2010:05:22	02:43	-17.9	312.3	81.0	21:30	36.0	258.2	80.6
2010:05:25	02:39	-18.7	312.4	79.6	21:35	33.7	259.7	79.2
2010:05:28	02:35	-19.5	312.6	78.2	21:39	31.4	261.2	77.8
2010:05:31	02:32	-20.3	312.9	76.8	21:43	29.1	262.6	76.4
2010:06:03	02:29	-21.2	313.2	75.4	21:47	26.9	263.8	75.1
2010:06:06	02:27	-22.2	313.6	74.1	21:51	24.8	265.0	73.8
2010:06:09	02:25	-23.2	314.1	72.8	21:54	22.8	266.0	72.5
2010:06:12	02:23	-24.3	314.8	71.5	21:56	20.8	266.9	71.2
2010:06:15	02:23	-25.5	315.6	70.3	21:58	18.9	267.8	69.9
2010:06:18	02:22	-26.8	316.5	69.0	22:00	17.2	268.5	68.7
2010:06:21	02:23	-28.1	317.5	67.8	22:01	15.5	269.1	67.5
2010:06:24	02:24	-29.5	318.8	66.6	22:01	13.9	269.6	66.3
2010:06:27	02:25	-31.0	320.2	65.4	22:01	12.5	269.9	65.1
2010:06:30	02:27	-32.5	321.7	64.2	22:00	11.1	270.2	63.9

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:07:01	02:28	-33.0	322.3	63.8	22:00	10.7	270.3	63.5
2010:07:04	02:31	-34.5	324.1	62.7	21:58	9.5	270.4	62.4
2010:07:07	02:34	-36.1	326.1	61.5	21:56	8.4	270.4	61.2
2010:07:10	02:37	-37.6	328.3	60.4	21:54	7.4	270.4	60.1
2010:07:13	02:41	-39.2	330.7	59.3	21:51	6.5	270.2	59.0
2010:07:16	02:45	-40.7	333.2	58.2	21:47	5.6	270.0	57.9
2010:07:19	02:49	-42.2	336.0	57.1	21:43	4.8	269.7	56.8
2010:07:22	02:54	-43.6	338.9	56.0	21:39	4.1	269.3	55.8
2010:07:25	02:59	-44.9	342.0	55.0	21:35	3.5	268.9	54.7
2010:07:28	03:03	-46.2	345.2	53.9	21:30	2.9	268.4	53.7
2010:07:31	03:08	-47.4	348.6	52.9	21:25	2.4	267.8	52.6
2010:08:03	03:13	-48.5	352.2	51.8	21:20	1.9	267.3	51.6
2010:08:06	03:18	-49.4	355.8	50.8	21:14	1.4	266.6	50.6
2010:08:09	03:23	-50.3	359.6	49.8	21:09	1.0	266.0	49.6
2010:08:12	03:27	-51.0	3.5	48.8	21:03	0.6	265.3	48.6
2010:08:15	03:32	-51.6	7.4	47.8	20:57	0.2	264.6	47.6
2010:08:18	03:37	-52.1	11.4	46.8	20:51	-0.1	263.8	46.6
2010:08:21	03:41	-52.4	15.3	45.8	20:45	-0.4	263.1	45.6
2010:08:24	03:45	-52.7	19.3	44.9	20:39	-0.7	262.3	44.6
2010:08:27	03:50	-52.8	23.2	43.9	20:33	-1.0	261.5	43.7
2010:08:30	03:54	-52.9	27.1	42.9	20:27	-1.2	260.7	42.7
2010:09:02	03:58	-52.8	30.9	42.0	20:21	-1.5	259.9	41.8
2010:09:05	04:02	-52.6	34.6	41.0	20:15	-1.7	259.0	40.8
2010:09:08	04:06	-52.4	38.2	40.1	20:09	-1.9	258.2	39.9
2010:09:11	04:10	-52.0	41.7	39.2	20:03	-2.1	257.4	39.0
2010:09:14	04:14	-51.6	45.0	38.2	19:57	-2.3	256.6	38.0
2010:09:17	04:18	-51.2	48.3	37.3	19:51	-2.5	255.8	37.1
2010:09:20	04:21	-50.7	51.4	36.4	19:46	-2.7	255.0	36.2
2010:09:23	04:25	-50.1	54.4	35.5	19:40	-2.9	254.2	35.3
2010:09:26	04:28	-49.5	57.2	34.6	19:34	-3.1	253.4	34.4
2010:09:29	04:32	-48.8	60.0	33.7	19:29	-3.2	252.6	33.5
2010:10:02	04:35	-48.2	62.6	32.8	19:24	-3.4	251.8	32.6
2010:10:05	04:39	-47.5	65.1	31.9	19:18	-3.6	251.1	31.7
2010:10:08	04:42	-46.7	67.5	31.0	19:13	-3.7	250.4	30.9
2010:10:11	04:45	-46.0	69.7	30.2	19:08	-3.9	249.7	30.0
2010:10:14	04:49	-45.2	71.9	29.3	19:04	-4.0	249.0	29.1
2010:10:17	04:52	-44.4	74.0	28.4	18:59	-4.2	248.4	28.3
2010:10:20	04:55	-43.6	76.0	27.6	18:55	-4.4	247.8	27.4
2010:10:23	04:58	-42.8	77.8	26.7	18:50	-4.5	247.2	26.5
2010:10:26	05:02	-42.0	79.6	25.9	18:46	-4.7	246.7	25.7
2010:10:29	05:05	-41.2	81.3	25.0	18:43	-4.9	246.2	24.9
2010:11:01	05:08	-40.4	83.0	24.2	18:39	-5.1	245.7	24.0
2010:11:04	05:11	-39.5	84.5	23.3	18:36	-5.3	245.3	23.2
2010:11:07	05:15	-38.7	86.0	22.5	18:33	-5.5	244.9	22.4
2010:11:10	05:18	-37.9	87.4	21.7	18:30	-5.7	244.6	21.5
2010:11:13	05:21	-37.0	88.7	20.9	18:28	-5.9	244.4	20.7
2010:11:16	05:24	-36.2	89.9	20.0	18:26	-6.2	244.2	19.9
2010:11:19	05:27	-35.3	91.1	19.2	18:24	-6.4	244.1	19.1
2010:11:22	05:30	-34.5	92.2	18.4	18:22	-6.7	244.0	18.3
2010:11:25	05:33	-33.7	93.2	17.6	18:21	-6.9	244.0	17.5
2010:11:28	05:36	-32.9	94.1	16.8	18:20	-7.2	244.0	16.7
2010:12:01	05:39	-32.0	95.0	16.0	18:19	-7.5	244.2	15.9
2010:12:04	05:41	-31.2	95.8	15.2	18:19	-7.9	244.3	15.1
2010:12:07	05:44	-30.4	96.5	14.5	18:19	-8.2	244.6	14.3
2010:12:10	05:46	-29.7	97.2	13.7	18:19	-8.6	244.9	13.6
2010:12:13	05:49	-28.9	97.8	12.9	18:20	-9.0	245.3	12.8
2010:12:16	05:51	-28.2	98.3	12.2	18:21	-9.4	245.8	12.0
2010:12:19	05:52	-27.4	98.8	11.4	18:22	-9.8	246.3	11.3
2010:12:22	05:54	-26.7	99.1	10.6	18:23	-10.2	247.0	10.5
2010:12:25	05:55	-26.0	99.4	9.9	18:25	-10.7	247.6	9.8
2010:12:28	05:56	-25.4	99.7	9.2	18:27	-11.2	248.4	9.0
2010:12:31	05:57	-24.7	99.8	8.4	18:29	-11.7	249.2	8.3

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

heliacal dates for Mars in 2010  
location : Rome (Italy)  
latitude : 41° 52' 12'' N  
longitude: 12° 37' 12'' E  
variable arcus visionis:  
arcvis [°] = 10.5 + 1.4 \* magnitude  
critical altitude: 0.00°

date eliache per Marte  
posizione : Roma  
latitudine : 41° 52' 12'' N  
longitudine: 12° 37' 12'' E  
visibilità minima [°] = 10.5 + 1.4 \* magnitudine  
altezza critica : 0.00°

	date	obj r/s	sun r/s	d r/s	age	mag
last visibility	2010-11-02	18:09	17:02	1:06h	-94d 00h	1.6

Date : data nel formato mese/giorno  
Obj r/s : ora del tramonto o della levata del pianeta  
Sun r/s: ora del tramonto o della levata del Sole  
D r/s : differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due oggetti  
Age : giorni trascorsi dalla congiunzione col Sole  
Mag : magnitudine  
Morning visibility begins = inizio visibilità mattutina  
Morning visibility ends = fine visibilità mattutina  
Evening visibility begins = inizio visibilità serale  
Evening visibility ends = fine visibilità serale  
Last visibility : ultimo giorno di visibilità  
Firs visibilità : primo giorno di visibilità

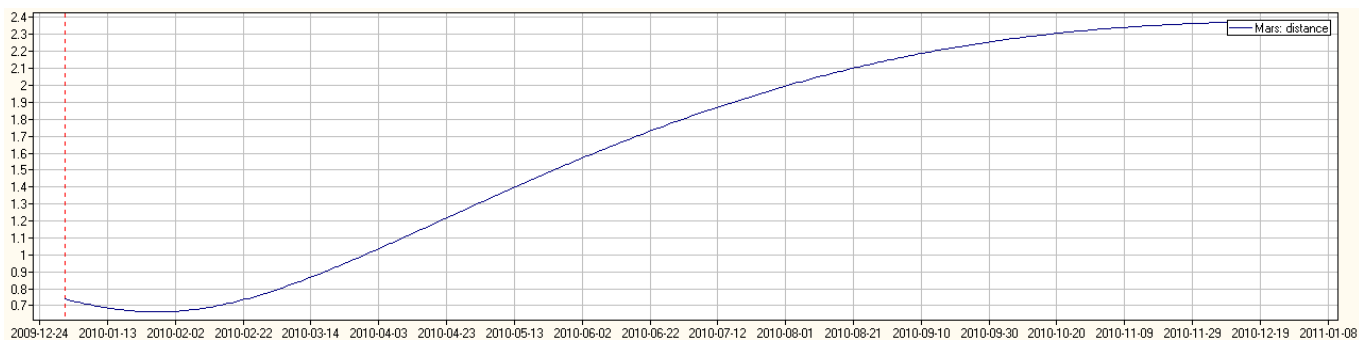
Obj r/s : rising and setting of the planet  
Sun r/s : sunrise and sunset  
D r/s : difference in hours and minutes between the instants of the rising or the setting of the two objects  
Age : days from the conjunction with the Sun  
Mag : magnitude

	date	obj r/s	sun r/s	sun alt	sun lon	obj lon	obj lat	mag	d az	d lon
L	11-02	18:09	17:02	-12° 50'	220° 10'	243° 54'	-0° 35'	1.6	-20° 27'	23° 44'

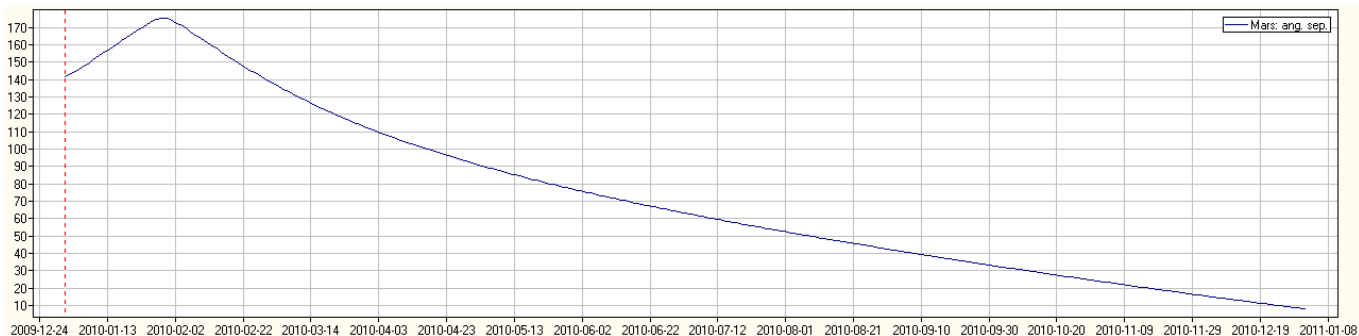
Date : data nel formato mese/giorno  
Sun alt : altezza del Sole nell'istante di visibilità del pianeta  
Sun lon : longitudine celeste del Sole  
Obj lon : longitudine celeste del pianeta  
Obj lat : latitudine celeste del pianeta  
Mag : magnitudine  
D az : differenza in azimut tra i centri del Sole e del pianeta nell'istante della sua visibilità  
D lon : differenza in longitudine tra i centri del Sole e del pianeta nell'istante della sua visibilità  
L = ultimo giorno di visibilità  
F = primo giorno di visibilità

Date : date in the format month/day  
Sun alt : altitude of the Sun in the instant of visibility of the planet  
Sun lon : celestial longitude of the Sun  
Obj lon : celestial longitude of the planet  
Obj lat : Celestial latitude of the planet  
Mag : magnitude  
D az : difference in azimuth between the centers of the Sun and the planet in the instant of its visibility  
D lon : difference in longitude between the centers of the Sun and the planet in the instant of its visibility

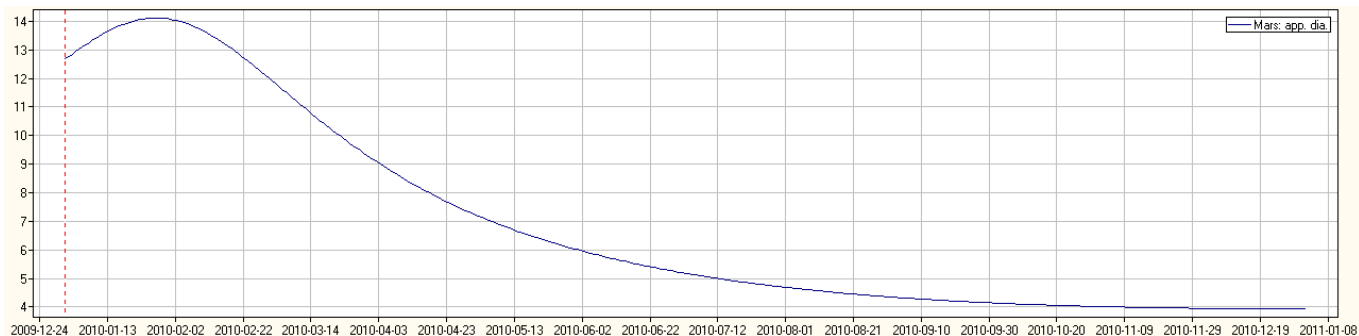
© (3)



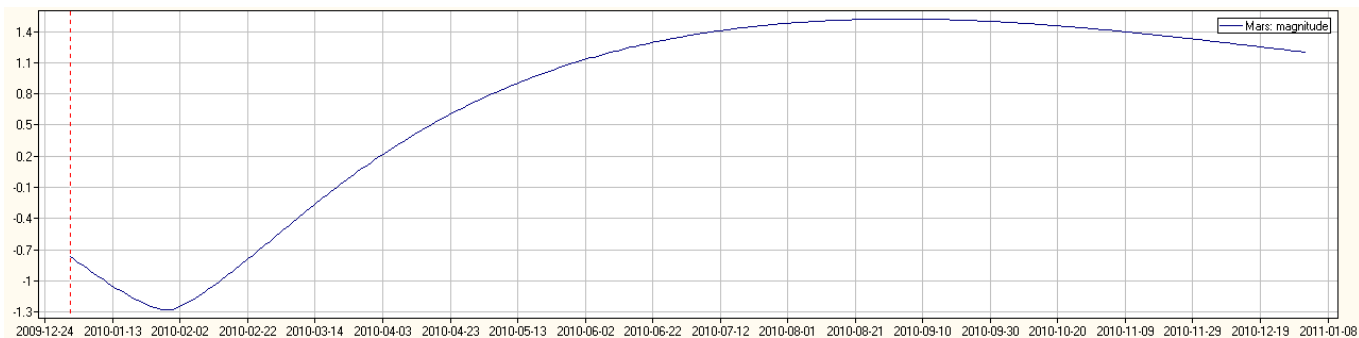
Distanza di Marte in U.A. nel corso dell'anno - Distance of Mars in A.U. during the year



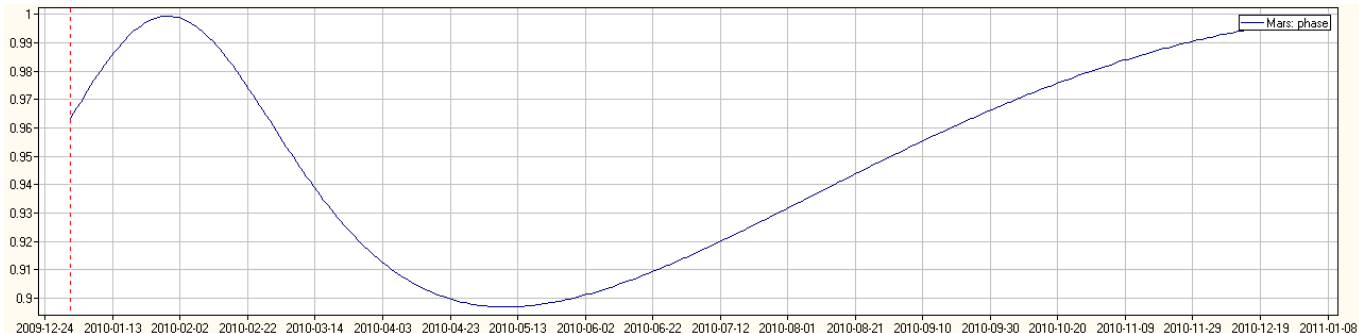
Elongazione di Marte in ° nel corso dell'anno - Elongation of Mars in ° during the year



Diametro di Marte in " nel corso dell'anno - Diameter of Mars in " during the year



Magnitudine di Marte nel corso dell'anno - Magnitude of Mars during the year



Fase di Marte nel corso dell'anno - Phase of Mars during the year



# MERIDIANO CENTRALE DI MARTE – TRANSITI

## CENTRAL MERIDIAN OF MARS – TRANSITS

Date	Time	02/04/2010	06.16.32	02/07/2010	16.41.30	02/10/2010	04.26.35
02/01/2010	00.29.12	03/04/2010	06.54.53	03/07/2010	17.21.38	03/10/2010	05.06.55
03/01/2010	01.05.52	04/04/2010	07.33.18	04/07/2010	18.01.48	04/10/2010	05.47.05
04/01/2010	01.42.25	05/04/2010	08.11.42	05/07/2010	18.41.50	05/10/2010	06.27.24
05/01/2010	02.18.58	06/04/2010	08.50.11	06/07/2010	19.22.00	06/10/2010	07.07.35
06/01/2010	02.55.25	07/04/2010	09.28.39	07/07/2010	20.02.04	07/10/2010	07.47.54
07/01/2010	03.31.51	08/04/2010	10.07.12	08/07/2010	20.42.15	08/10/2010	08.28.12
08/01/2010	04.08.11	09/04/2010	10.45.44	09/07/2010	21.22.20	09/10/2010	09.08.22
09/01/2010	04.44.31	10/04/2010	11.24.21	10/07/2010	22.02.33	10/10/2010	09.48.40
10/01/2010	05.20.45	11/04/2010	12.03.00	11/07/2010	22.42.38	11/10/2010	10.28.50
11/01/2010	05.56.59	12/04/2010	12.41.38	12/07/2010	23.22.52	12/10/2010	11.09.08
12/01/2010	06.33.06	13/04/2010	13.20.20	14/07/2010	00.03.06	13/10/2010	11.49.17
13/01/2010	07.09.15	14/04/2010	13.59.01	15/07/2010	00.43.13	14/10/2010	12.29.34
14/01/2010	07.45.17	15/04/2010	14.37.47	16/07/2010	01.23.29	15/10/2010	13.09.43
15/01/2010	08.21.20	16/04/2010	15.16.31	17/07/2010	02.03.36	16/10/2010	13.50.00
16/01/2010	08.57.17	17/04/2010	15.55.21	18/07/2010	02.43.53	17/10/2010	14.30.17
17/01/2010	09.33.16	18/04/2010	16.34.09	19/07/2010	03.24.01	18/10/2010	15.10.26
18/01/2010	10.09.09	19/04/2010	17.13.02	20/07/2010	04.04.19	19/10/2010	15.50.42
19/01/2010	10.45.04	20/04/2010	17.51.52	21/07/2010	04.44.28	20/10/2010	16.30.51
20/01/2010	11.20.53	21/04/2010	18.30.48	22/07/2010	05.24.46	21/10/2010	17.11.07
21/01/2010	11.56.45	22/04/2010	19.09.42	23/07/2010	06.05.05	22/10/2010	17.51.15
22/01/2010	12.32.31	23/04/2010	19.48.41	24/07/2010	06.45.15	23/10/2010	18.31.31
23/01/2010	13.08.21	24/04/2010	20.27.42	25/07/2010	07.25.34	24/10/2010	19.11.39
24/01/2010	13.44.04	25/04/2010	21.06.40	26/07/2010	08.05.46	25/10/2010	19.51.54
25/01/2010	14.19.52	26/04/2010	21.45.44	27/07/2010	08.46.05	26/10/2010	20.32.10
26/01/2010	14.55.35	27/04/2010	22.24.44	28/07/2010	09.26.17	27/10/2010	21.12.17
27/01/2010	15.31.22	28/04/2010	23.03.51	29/07/2010	10.06.38	28/10/2010	21.52.33
28/01/2010	16.07.04	29/04/2010	23.42.54	30/07/2010	10.46.50	29/10/2010	22.32.40
29/01/2010	16.42.51	01/05/2010	00.22.04	31/07/2010	11.27.11	30/10/2010	23.12.56
30/01/2010	17.18.33	02/05/2010	01.01.09	01/08/2010	12.07.33	31/10/2010	23.53.03
31/01/2010	17.54.20	03/05/2010	01.40.21	02/08/2010	12.47.46	02/11/2010	00.33.18
01/02/2010	18.30.04	04/05/2010	02.19.30	03/08/2010	13.28.08	03/11/2010	01.13.33
02/02/2010	19.05.52	05/05/2010	02.58.44	04/08/2010	14.08.21	04/11/2010	01.53.40
03/02/2010	19.41.37	06/05/2010	03.38.00	05/08/2010	14.48.44	05/11/2010	02.33.55
04/02/2010	20.17.28	07/05/2010	04.17.12	06/08/2010	15.28.58	06/11/2010	03.14.02
05/02/2010	20.53.16	08/05/2010	04.56.31	07/08/2010	16.09.21	07/11/2010	03.54.17
06/02/2010	21.29.09	09/05/2010	05.35.45	08/08/2010	16.49.44	08/11/2010	04.34.24
07/02/2010	22.05.00	10/05/2010	06.15.06	09/08/2010	17.29.58	09/11/2010	05.14.39
08/02/2010	22.40.57	11/05/2010	06.54.23	10/08/2010	18.10.22	10/11/2010	05.54.46
09/02/2010	23.16.52	12/05/2010	07.33.46	11/08/2010	18.50.37	11/11/2010	06.35.01
10/02/2010	23.52.53	13/05/2010	08.13.05	12/08/2010	19.31.01	12/11/2010	07.15.16
12/02/2010	00.28.52	14/05/2010	08.52.31	13/08/2010	20.11.16	13/11/2010	07.55.23
13/02/2010	01.04.57	15/05/2010	09.31.52	14/08/2010	20.51.40	14/11/2010	08.35.38
14/02/2010	01.41.02	16/05/2010	10.11.20	15/08/2010	21.31.55	15/11/2010	09.15.45
15/02/2010	02.17.12	17/05/2010	10.50.49	16/08/2010	22.12.19	16/11/2010	09.56.00
16/02/2010	02.53.22	18/05/2010	11.30.13	17/08/2010	22.52.43	17/11/2010	10.36.07
17/02/2010	03.29.38	19/05/2010	12.09.45	18/08/2010	23.32.59	18/11/2010	11.16.22
18/02/2010	04.05.54	20/05/2010	12.49.11	20/08/2010	00.13.23	19/11/2010	11.56.29
19/02/2010	04.42.16	21/05/2010	13.28.45	21/08/2010	00.53.39	20/11/2010	12.36.44
20/02/2010	05.18.38	22/05/2010	14.08.13	22/08/2010	01.34.03	21/11/2010	13.17.00
21/02/2010	05.55.06	23/05/2010	14.47.49	23/08/2010	02.14.19	22/11/2010	13.57.07
22/02/2010	06.31.34	24/05/2010	15.27.19	24/08/2010	02.54.44	23/11/2010	14.37.23
23/02/2010	07.08.08	25/05/2010	16.06.57	25/08/2010	03.34.59	24/11/2010	15.17.31
24/02/2010	07.44.44	26/05/2010	16.46.29	26/08/2010	04.15.24	25/11/2010	15.57.47
25/02/2010	08.21.24	27/05/2010	17.26.08	27/08/2010	04.55.48	26/11/2010	16.37.55
26/02/2010	08.58.06	28/05/2010	18.05.49	28/08/2010	05.36.04	27/11/2010	17.18.11
27/02/2010	09.34.53	29/05/2010	18.45.24	29/08/2010	06.16.28	28/11/2010	17.58.19
28/02/2010	10.11.41	30/05/2010	19.25.07	30/08/2010	06.56.43	29/11/2010	18.38.36
01/03/2010	10.48.33	31/05/2010	20.04.43	31/08/2010	07.37.08	30/11/2010	19.18.53
02/03/2010	11.25.30	01/06/2010	20.44.28	01/09/2010	08.17.23	01/12/2010	19.59.02
03/03/2010	12.02.28	02/06/2010	21.24.06	02/09/2010	08.57.47	02/12/2010	20.39.19
04/03/2010	12.39.31	03/06/2010	22.03.53	03/09/2010	09.38.11	03/12/2010	21.19.28
05/03/2010	13.16.37	04/06/2010	22.43.33	04/09/2010	10.18.26	04/12/2010	21.59.46
06/03/2010	13.53.46	05/06/2010	23.23.21	05/09/2010	10.58.50	05/12/2010	22.39.56
07/03/2010	14.30.58	07/06/2010	00.03.10	06/09/2010	11.39.05	06/12/2010	23.20.14
08/03/2010	15.08.13	08/06/2010	00.42.53	07/09/2010	12.19.29	08/12/2010	00.00.33
09/03/2010	15.45.31	09/06/2010	01.22.44	08/09/2010	12.59.44	09/12/2010	00.40.43
10/03/2010	16.22.53	10/06/2010	02.02.29	09/09/2010	13.40.07	10/12/2010	01.21.02
11/03/2010	17.00.17	11/06/2010	02.42.21	10/09/2010	14.20.22	11/12/2010	02.01.13
12/03/2010	17.37.44	12/06/2010	03.22.07	11/09/2010	15.00.45	12/12/2010	02.41.33
13/03/2010	18.15.15	13/06/2010	04.02.02	12/09/2010	15.41.08	13/12/2010	03.21.45
14/03/2010	18.52.48	14/06/2010	04.41.50	13/09/2010	16.21.22	14/12/2010	04.02.05
15/03/2010	19.30.25	15/06/2010	05.21.45	14/09/2010	17.01.45	15/12/2010	04.42.18
16/03/2010	20.08.04	16/06/2010	06.01.42	15/09/2010	17.41.59	16/12/2010	05.22.39
17/03/2010	20.45.47	17/06/2010	06.41.32	16/09/2010	18.22.21	17/12/2010	06.03.00
18/03/2010	21.23.31	18/06/2010	07.21.31	17/09/2010	19.02.35	18/12/2010	06.43.14
19/03/2010	22.01.20	19/06/2010	08.01.22	18/09/2010	19.42.57	19/12/2010	07.23.36
20/03/2010	22.39.10	20/06/2010	08.41.22	19/09/2010	20.23.10	20/12/2010	08.03.50
21/03/2010	23.17.03	21/06/2010	09.21.15	20/09/2010	21.03.32	21/12/2010	08.44.13
22/03/2010	23.54.58	22/06/2010	10.01.17	21/09/2010	21.43.53	22/12/2010	09.24.28
24/03/2010	00.32.58	23/06/2010	10.41.11	22/09/2010	22.24.06	23/12/2010	10.04.52
25/03/2010	01.10.58	24/06/2010	11.21.14	23/09/2010	23.04.27	24/12/2010	10.45.07
26/03/2010	01.49.02	25/06/2010	12.01.18	24/09/2010	23.44.40	25/12/2010	11.25.32
27/03/2010	02.27.09	26/06/2010	12.41.14	26/09/2010	00.25.00	26/12/2010	12.05.58
28/03/2010	03.05.16	27/06/2010	13.21.19	27/09/2010	01.05.12	27/12/2010	12.46.15
29/03/2010	03.43.28	28/06/2010	14.01.17	28/09/2010	01.45.33	28/12/2010	13.26.41
30/03/2010	04.21.39	29/06/2010	14.41.23	29/09/2010	02.25.53	29/12/2010	14.06.59
31/03/2010	04.59.56	30/06/2010	15.21.22	30/09/2010	03.06.04	30/12/2010	14.47.26
01/04/2010	05.38.12	01/07/2010	16.01.29	01/10/2010	03.46.24	31/12/2010	15.27.45

Orari in T.U. (hh.mm,m) in cui transita la Syrtis major

Times in U.T. (hh.mm,m) of the transits of the Syrtis major

# MERIDIANO CENTRALE DI MARTE

## CENTRAL MERIDIAN OF MARS

Data	Gen	Feb	Mar	Apr	Mag	Giu	Lug	Ago	Set	Ott	Nov	Dic
Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	o	o	o	o	o	o	o	o	o	o	o	o
1	293.6	21.0	133.7	209.4	286.4	349.0	57.9	114.9	170.8	236.7	293.5	0.2
2	284.7	12.3	124.7	200.1	276.9	339.4	48.2	105.1	161.0	226.9	283.7	350.4
3	275.7	3.6	115.7	190.8	267.4	329.7	38.4	95.3	151.2	217.1	273.9	340.6
4	266.8	354.8	106.7	181.4	257.8	320.0	28.7	85.5	141.4	207.4	264.1	330.8
5	257.9	346.1	97.6	172.1	248.3	310.4	18.9	75.6	131.6	197.6	254.4	321.0
6	249.0	337.3	88.6	162.7	238.7	300.7	9.2	65.8	121.8	187.8	244.6	311.2
7	240.1	328.6	79.5	153.3	229.2	291.0	359.4	56.0	112.0	178.0	234.8	301.4
8	231.3	319.8	70.5	143.9	219.6	281.3	349.6	46.2	102.1	168.2	225.0	291.7
9	222.4	311.1	61.4	134.6	210.1	271.7	339.9	36.4	92.3	158.4	215.3	281.9
10	213.6	302.3	52.3	125.2	200.5	262.0	330.1	26.6	82.5	148.6	205.5	272.1
11	204.7	293.5	43.2	115.8	190.9	252.3	320.3	16.8	72.7	138.8	195.7	262.3
12	195.9	284.8	34.1	106.4	181.4	242.6	310.6	7.0	62.9	129.1	185.9	252.5
13	187.1	276.0	24.9	96.9	171.8	232.9	300.8	357.2	53.1	119.3	176.2	242.7
14	178.3	267.2	15.8	87.5	162.2	223.2	291.0	347.4	43.3	109.5	166.4	232.9
15	169.5	258.3	6.6	78.1	152.6	213.5	281.3	337.6	33.5	99.7	156.6	223.1
16	160.7	249.5	357.5	68.7	143.0	203.8	271.5	327.8	23.7	89.9	146.8	213.3
17	152.0	240.7	348.3	59.2	133.4	194.1	261.7	318.0	13.9	80.1	137.1	203.5
18	143.2	231.8	339.1	49.8	123.8	184.4	251.9	308.2	4.1	70.4	127.3	193.7
19	134.5	223.0	329.9	40.3	114.2	174.7	242.1	298.3	354.3	60.6	117.5	183.9
20	125.7	214.1	320.7	30.9	104.6	165.0	232.4	288.5	344.5	50.8	107.7	174.1
21	117.0	205.2	311.5	21.4	95.0	155.2	222.6	278.7	334.7	41.0	98.0	164.3
22	108.2	196.3	302.2	11.9	85.4	145.5	212.8	268.9	324.9	31.2	88.2	154.5
23	99.5	187.4	293.0	2.4	75.8	135.8	203.0	259.1	315.1	21.4	78.4	144.7
24	90.8	178.5	283.8	353.0	66.1	126.1	193.2	249.3	305.3	11.7	68.6	134.9
25	82.0	169.6	274.5	343.5	56.5	116.3	183.4	239.5	295.5	1.9	58.8	125.1
26	73.3	160.6	265.2	334.0	46.9	106.6	173.6	229.7	285.7	352.1	49.1	115.2
27	64.6	151.7	256.0	324.5	37.2	96.9	163.8	219.9	275.9	342.3	39.3	105.4
28	55.9	142.7	246.7	315.0	27.6	87.1	154.0	210.0	266.1	332.6	29.5	95.6
29	47.2		237.4	305.5	18.0	77.4	144.2	200.2	256.3	322.8	19.7	85.8
30	38.4		228.1	295.9	8.3	67.7	134.5	190.4	246.5	313.0	9.9	76.0
31	29.7		218.8		358.7		124.7	180.6		303.2		66.1

Moto del meridiano centrale - Motion of the central meridian

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
m	o	o	o	o	o	o	o	o	o	o	o	o
0	0.0	14.6	29.2	43.9	58.5	73.1	87.7	102.3	117.0	131.6	146.2	160.8
10	2.4	17.1	31.7	46.3	60.9	75.5	90.2	104.8	119.4	134.0	148.6	163.3
20	4.9	19.5	34.1	48.7	63.4	78.0	92.6	107.2	121.8	136.5	151.1	165.7
30	7.3	21.9	36.6	51.2	65.8	80.4	95.0	109.7	124.3	138.9	153.5	168.1
40	9.7	24.4	39.0	53.6	68.2	82.8	97.5	112.1	126.7	141.3	156.0	170.6
50	12.2	26.8	41.4	56.0	70.7	85.3	99.9	114.5	129.1	143.8	158.4	173.0
60	14.6	29.2	43.9	58.5	73.1	87.7	102.3	117.0	131.6	146.2	160.8	175.4

Longitudine del meridiano che transita alle ore 0 T.U. del giorno indicato e moto medio in gradi

Longitude of the central meridian at 0 U.T. of the day and medium motion in °

# EFFEMERIDI DI GIOVE - EPHEMERIDES OF JUPITER

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq.*	Diam. Pol.*	Mag.	Phase angle*	Rise	Transit	Set
01/01/2010	21h 55m 41.12s	-13° 36' 32.5"	5.003374	5.6373654	46.88	45.9	34.9	32.7	-2.1	8.1	10.09	15.21	20.34
02/01/2010	21h 56m 28.16s	-13° 32' 20.6"	5.003136	5.6484926	46.98	45.1	34.9	32.6	-2.1	8.0	10.05	15.18	20.31
03/01/2010	21h 57m 15.49s	-13° 28' 06.6"	5.002898	5.6594651	47.07	44.3	34.8	32.5	-2.1	7.9	10.02	15.15	20.28
04/01/2010	21h 58m 03.10s	-13° 23' 50.5"	5.002661	5.6702810	47.16	43.5	34.7	32.5	-2.1	7.8	9.58	15.12	20.25
05/01/2010	21h 58m 50.99s	-13° 19' 32.3"	5.002424	5.6809385	47.25	42.7	34.7	32.4	-2.1	7.7	9.55	15.09	20.22
06/01/2010	21h 59m 39.16s	-13° 15' 12.1"	5.002187	5.6914355	47.33	41.9	34.6	32.4	-2.1	7.5	9.52	15.05	20.19
07/01/2010	22h 00m 27.59s	-13° 10' 49.8"	5.001951	5.7017701	47.42	41.0	34.5	32.3	-2.1	7.4	9.48	15.02	20.17
08/01/2010	22h 01m 16.30s	-13° 06' 25.6"	5.001716	5.7119401	47.51	40.2	34.5	32.2	-2.1	7.3	9.45	14.59	20.14
09/01/2010	22h 02m 05.27s	-13° 01' 59.3"	5.001481	5.7219435	47.59	39.4	34.4	32.2	-2.1	7.2	9.41	14.56	20.11
10/01/2010	22h 02m 54.49s	-12° 57' 31.0"	5.001246	5.7317782	47.67	38.6	34.4	32.1	-2.1	7.0	9.38	14.53	20.08
11/01/2010	22h 03m 43.97s	-12° 53' 00.8"	5.001012	5.7414421	47.75	37.8	34.3	32.1	-2.1	6.9	9.35	14.50	20.05
12/01/2010	22h 04m 33.68s	-12° 48' 28.7"	5.000779	5.7509335	47.83	37.0	34.2	32.0	-2.1	6.8	9.31	14.47	20.02
13/01/2010	22h 05m 23.63s	-12° 43' 54.8"	5.000545	5.7602502	47.91	36.2	34.2	32.0	-2.1	6.7	9.28	14.44	20.00
14/01/2010	22h 06m 13.81s	-12° 39' 19.0"	5.000313	5.7693905	47.98	35.4	34.1	31.9	-2.1	6.5	9.24	14.41	19.57
15/01/2010	22h 07m 04.21s	-12° 34' 41.4"	5.000080	5.7783526	48.06	34.6	34.1	31.9	-2.1	6.4	9.21	14.37	19.54
16/01/2010	22h 07m 54.82s	-12° 30' 02.1"	4.999848	5.7871348	48.13	33.8	34.0	31.8	-2.1	6.3	9.18	14.34	19.51
17/01/2010	22h 08m 45.63s	-12° 25' 21.1"	4.999617	5.7957356	48.20	33.0	34.0	31.8	-2	6.2	9.14	14.31	19.48
18/01/2010	22h 09m 36.64s	-12° 20' 38.3"	4.999386	5.8041534	48.27	32.2	33.9	31.7	-2	6.0	9.11	14.28	19.46
19/01/2010	22h 10m 27.84s	-12° 15' 53.9"	4.999155	5.8123868	48.34	31.4	33.9	31.7	-2	5.9	9.07	14.25	19.43
20/01/2010	22h 11m 19.23s	-12° 11' 07.9"	4.998925	5.8204345	48.41	30.6	33.8	31.6	-2	5.8	9.04	14.22	19.40
21/01/2010	22h 12m 10.80s	-12° 06' 20.3"	4.998696	5.8282952	48.47	29.8	33.8	31.6	-2	5.6	9.01	14.19	19.37
22/01/2010	22h 13m 02.54s	-12° 01' 31.1"	4.998467	5.8359679	48.54	29.0	33.7	31.6	-2	5.5	8.57	14.16	19.35
23/01/2010	22h 13m 54.45s	-11° 56' 40.3"	4.998238	5.8434514	48.60	28.3	33.7	31.5	-2	5.3	8.54	14.13	19.32
24/01/2010	22h 14m 46.52s	-11° 51' 48.0"	4.998010	5.8507449	48.66	27.5	33.7	31.5	-2	5.2	8.51	14.10	19.29
25/01/2010	22h 15m 38.76s	-11° 46' 54.3"	4.997782	5.8578474	48.72	26.7	33.6	31.4	-2	5.1	8.47	14.07	19.26
26/01/2010	22h 16m 31.14s	-11° 41' 59.1"	4.997554	5.8647582	48.78	25.9	33.6	31.4	-2	4.9	8.44	14.04	19.24
27/01/2010	22h 17m 23.67s	-11° 37' 02.4"	4.997328	5.8714765	48.83	25.1	33.5	31.4	-2	4.8	8.40	14.01	19.21
28/01/2010	22h 18m 16.34s	-11° 32' 04.5"	4.997101	5.8780019	48.89	24.3	33.5	31.3	-2	4.7	8.37	13.58	19.18
29/01/2010	22h 19m 09.14s	-11° 27' 05.1"	4.996875	5.8843338	48.94	23.5	33.5	31.3	-2	4.5	8.34	13.54	19.15
30/01/2010	22h 20m 02.06s	-11° 22' 04.5"	4.996650	5.8904715	48.99	22.8	33.4	31.3	-2	4.4	8.30	13.51	19.13
31/01/2010	22h 20m 55.10s	-11° 17' 02.6"	4.996425	5.8964144	49.04	22.0	33.4	31.2	-2	4.2	8.27	13.48	19.10
01/02/2010	22h 21m 48.26s	-11° 11' 59.5"	4.996200	5.9021619	49.09	21.2	33.4	31.2	-2	4.1	8.24	13.45	19.07
02/02/2010	22h 22m 41.52s	-11° 06' 55.1"	4.995976	5.9077130	49.13	20.4	33.3	31.2	-2	3.9	8.20	13.42	19.04
03/02/2010	22h 23m 34.89s	-11° 01' 49.5"	4.995752	5.9130669	49.18	19.6	33.3	31.1	-2	3.8	8.17	13.39	19.02
04/02/2010	22h 24m 28.37s	-10° 56' 42.6"	4.995529	5.9182226	49.22	18.9	33.3	31.1	-2	3.7	8.14	13.36	18.59
05/02/2010	22h 25m 21.95s	-10° 51' 34.6"	4.995306	5.9231790	49.26	18.1	33.2	31.1	-2	3.5	8.10	13.33	18.56
06/02/2010	22h 26m 15.62s	-10° 46' 25.5"	4.995084	5.9279352	49.30	17.3	33.2	31.1	-2	3.4	8.07	13.30	18.53
07/02/2010	22h 27m 09.39s	-10° 41' 15.2"	4.994862	5.9324901	49.34	16.5	33.2	31.0	-2	3.2	8.03	13.27	18.51
08/02/2010	22h 28m 03.25s	-10° 36' 03.8"	4.994641	5.9368427	49.38	15.7	33.2	31.0	-2	3.1	8.00	13.24	18.48
09/02/2010	22h 28m 57.18s	-10° 30' 51.4"	4.994420	5.9409923	49.41	15.0	33.1	31.0	-2	2.9	7.57	13.21	18.45
10/02/2010	22h 29m 51.19s	-10° 25' 38.0"	4.994200	5.9449379	49.44	14.2	33.1	31.0	-2	2.8	7.53	13.18	18.43
11/02/2010	22h 30m 45.27s	-10° 20' 23.7"	4.993980	5.9486788	49.47	13.4	33.1	31.0	-2	2.6	7.50	13.15	18.40
12/02/2010	22h 31m 39.40s	-10° 15' 08.4"	4.993760	5.9522143	49.50	12.6	33.1	30.9	-2	2.5	7.47	13.12	18.37
13/02/2010	22h 32m 33.60s	-10° 09' 52.2"	4.993541	5.9555438	49.53	11.9	33.1	30.9	-2	2.3	7.43	13.09	18.35
14/02/2010	22h 33m 27.84s	-10° 04' 35.2"	4.993323	5.9586668	49.56	11.1	33.0	30.9	-2	2.2	7.40	13.06	18.32
15/02/2010	22h 34m 22.13s	-09° 59' 17.4"	4.993105	5.9615827	49.58	10.3	33.0	30.9	-2	2.0	7.37	13.03	18.29
16/02/2010	22h 35m 16.45s	-09° 53' 58.9"	4.992887	5.9642913	49.60	9.6	33.0	30.9	-2	1.9	7.33	13.00	18.26
17/02/2010	22h 36m 10.81s	-09° 48' 39.5"	4.992670	5.9667922	49.62	8.8	33.0	30.9	-2	1.7	7.30	12.57	18.24
18/02/2010	22h 37m 05.20s	-09° 43' 19.5"	4.992453	5.9690853	49.64	8.0	33.0	30.9	-2	1.6	7.27	12.54	18.21
19/02/2010	22h 37m 59.62s	-09° 37' 58.7"	4.992237	5.9711705	49.66	7.3	33.0	30.8	-2	1.4	7.23	12.51	18.18
20/02/2010	22h 38m 54.05s	-09° 32' 37.3"	4.992021	5.9730478	49.68	6.5	33.0	30.8	-2	1.3	7.20	12.48	18.16
21/02/2010	22h 39m 48.51s	-09° 27' 15.3"	4.991806	5.9747171	49.69	5.8	33.0	30.8	-2	1.1	7.16	12.45	18.13
22/02/2010	22h 40m 42.97s	-09° 21' 52.8"	4.991591	5.9761788	49.70	5.0	32.9	30.8	-2	1.0	7.13	12.42	18.10
23/02/2010	22h 41m 37.45s	-09° 16' 29.6"	4.991377	5.9774331	49.71	4.3	32.9	30.8	-2	0.8	7.10	12.39	18.08
24/02/2010	22h 42m 31.92s	-09° 11' 06.0"	4.991163	5.9784802	49.72	3.5	32.9	30.8	-2	0.7	7.06	12.36	18.05
25/02/2010	22h 43m 26.39s	-09° 05' 42.0"	4.990950	5.9793206	49.73	2.8	32.9	30.8	-2	0.6	7.03	12.32	18.02
26/02/2010	22h 44m 20.85s	-09° 00' 17.5"	4.990737	5.9799547	49.73	2.1	32.9	30.8	-2	0.4	7.00	12.29	17.59
27/02/2010	22h 45m 15.30s	-08° 54' 52.7"	4.990525	5.9803828	49.74	1.5	32.9	30.8	-2	0.3	6.56	12.26	17.57
28/02/2010	22h 46m 09.71s	-08° 49' 27.7"	4.990313	5.9806054	49.74	1.1	32.9	30.8	-2	0.2	6.53	12.23	17.54
01/03/2010	22h 47m 04.09s	-08° 44' 02.3"	4.990101	5.9806226	49.74	1.1	32.9	30.8	-2	0.2	6.50	12.20	17.51
02/03/2010	22h 47m 58.44s	-08° 38' 36.3"	4.989890	5.9804346	49.74	1.6	32.9	30.8	-2	0.3	6.46	12.17	17.49
03/03/2010	22h 48m 52.78s	-08° 33' 10.0"	4.989680	5.9800415	49.73	2.2	32.9	30.8	-2	0.4	6.43	12.14	17.46
04/03/2010	22h 49m 47.09s	-08° 27' 43.5"	4.989470	5.9794433	49.73	2.9	32.9	30.8	-2	0.6	6.39	12.11	17.43
05/03/2010	22h 50m 41.36s	-08° 22' 16.8"	4.989260	5.9786398	49.72	3.6	32.9	30.8	-2	0.7	6.36	12.08	17.41
06/03/2010	22h 51m 35.60s	-08° 16' 49.9"	4.989051	5.9776311	49.71	4.3	32.9	30.8	-2	0.9	6.33	12.05	17.38
07/03/2010	22h 52m 29.80s	-08° 11' 22.9"	4.988843	5.9764169	49.70	5.1	32.9	30.8	-2	1.0	6.29	12.02	17.35
08/03/2010	22h 53m 23.95s	-08° 05' 55.7"	4.988635	5.9749975	49.69	5.8	33.0	30.8	-2	1.2	6.26	11.59	17.32
09/03/2010	22h 54m 18.04s	-08° 00' 28.4"	4.988427	5.9733727	49.68	6.6	33.0	30.8	-2	1.3	6.23	11.56	17.30
10/03/2010	22h 55m 12.08s	-07° 55' 01.1"	4.988220	5.9715427	49.66	7.3	33.0	30.8	-2	1.5	6.19	11.53	17.27
11/03/2010	22h 56m 06.05s	-07° 49' 33.8"	4.988013	5.9695077	49.65	8.1	33.0	30.8	-2	1.6	6.16	11.50	17.24
12/03/2010	22h 56m 59.95s	-07° 44' 06.5"	4.987807	5.9672680	49.63	8.8	33.0	30.9	-2	1.8	6.13	11.47	17.22
13/03/2010	22h 57m 53.78s	-07° 38' 39.3"	4.987601	5.9648238	49.61	9.6	33.0	30.9	-2	1.9	6.09	11.44	17.19
14/03/2010	22h 58m 47.53s	-07° 33' 12.2"	4.987396	5.9621756	49.59	10.3	33.0	30.9	-2	2.0	6.06	11.41	17.16
15/03/2010	22h 59m 41.19s	-07° 27' 45.3"	4.987191	5.9593238	49.56	11.1	33.0	30.9	-2	2.2	6.02	11.38	17.13
16/03/2010	23h 00m 34.77s	-07° 22' 18.6"	4.986987	5.9562689	49.54	11.8	3						

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq.*	Diam. Pol.*	Mag.	Phase angle*	Rise	Transit	Set
09/04/2010	23h 21m 23.10s	-05° 14' 07.4"	4.982233	5.8245238	48.44	30.0	33.8	31.6	-2	5.8	4.38	10.21	16.05
10/04/2010	23h 22m 13.10s	-05° 08' 57.0"	4.982041	5.8167075	48.38	30.7	33.9	31.7	-2.1	5.9	4.34	10.18	16.02
11/04/2010	23h 23m 02.90s	-05° 03' 47.8"	4.981850	5.8087136	48.31	31.5	33.9	31.7	-2.1	6.0	4.31	10.15	15.59
12/04/2010	23h 23m 52.50s	-04° 58' 39.7"	4.981659	5.8005432	48.24	32.2	33.9	31.7	-2.1	6.2	4.27	10.12	15.56
13/04/2010	23h 24m 41.88s	-04° 53' 32.9"	4.981468	5.7921978	48.17	33.0	34.0	31.8	-2.1	6.3	4.24	10.09	15.54
14/04/2010	23h 25m 31.06s	-04° 48' 27.3"	4.981278	5.7836788	48.10	33.8	34.0	31.8	-2.1	6.4	4.21	10.06	15.51
15/04/2010	23h 26m 20.02s	-04° 43' 23.0"	4.981089	5.7749877	48.03	34.5	34.1	31.9	-2.1	6.6	4.17	10.02	15.48
16/04/2010	23h 27m 08.75s	-04° 38' 20.0"	4.980900	5.7661261	47.96	35.3	34.1	31.9	-2.1	6.7	4.14	9.59	15.45
17/04/2010	23h 27m 57.26s	-04° 33' 18.4"	4.980712	5.7570958	47.88	36.0	34.2	32.0	-2.1	6.8	4.10	9.56	15.42
18/04/2010	23h 28m 45.54s	-04° 28' 18.2"	4.980524	5.7478985	47.80	36.8	34.3	32.0	-2.1	6.9	4.07	9.53	15.39
19/04/2010	23h 29m 33.58s	-04° 23' 19.4"	4.980336	5.7385361	47.73	37.6	34.3	32.1	-2.1	7.1	4.03	9.50	15.37
20/04/2010	23h 30m 21.37s	-04° 18' 22.2"	4.980150	5.7290105	47.65	38.3	34.4	32.1	-2.1	7.2	4.00	9.47	15.34
21/04/2010	23h 31m 08.92s	-04° 13' 26.5"	4.979963	5.7193238	47.57	39.1	34.4	32.2	-2.1	7.3	3.57	9.44	15.31
22/04/2010	23h 31m 56.21s	-04° 08' 32.4"	4.979777	5.7094778	47.48	39.9	34.5	32.3	-2.1	7.4	3.53	9.41	15.28
23/04/2010	23h 32m 43.24s	-04° 03' 39.9"	4.979592	5.6994747	47.40	40.6	34.5	32.3	-2.1	7.6	3.50	9.37	15.25
24/04/2010	23h 33m 30.00s	-03° 58' 49.1"	4.979407	5.6893163	47.32	41.4	34.6	32.4	-2.1	7.7	3.46	9.34	15.22
25/04/2010	23h 34m 16.50s	-03° 53' 59.9"	4.979223	5.6790044	47.23	42.2	34.7	32.4	-2.1	7.8	3.43	9.31	15.19
26/04/2010	23h 35m 02.72s	-03° 49' 12.5"	4.979039	5.6685410	47.14	42.9	34.7	32.5	-2.1	7.9	3.39	9.28	15.17
27/04/2010	23h 35m 48.68s	-03° 44' 26.8"	4.978856	5.6579278	47.06	43.7	34.8	32.5	-2.1	8.0	3.36	9.25	15.14
28/04/2010	23h 36m 34.35s	-03° 39' 42.9"	4.978673	5.6471663	46.97	44.4	34.9	32.6	-2.1	8.1	3.32	9.22	15.11
29/04/2010	23h 37m 19.75s	-03° 35' 00.7"	4.978491	5.6362582	46.88	45.2	34.9	32.7	-2.1	8.3	3.29	9.18	15.08
30/04/2010	23h 38m 04.87s	-03° 30' 20.4"	4.978309	5.6252049	46.78	46.0	35.0	32.7	-2.1	8.4	3.25	9.15	15.05
01/05/2010	23h 38m 49.69s	-03° 25' 41.9"	4.978127	5.6140080	46.69	46.8	35.1	32.8	-2.1	8.5	3.22	9.12	15.02
02/05/2010	23h 39m 34.23s	-03° 21' 05.3"	4.977947	5.6026691	46.60	47.5	35.1	32.9	-2.1	8.6	3.19	9.09	14.59
03/05/2010	23h 40m 18.46s	-03° 16' 30.7"	4.977766	5.5911895	46.50	48.3	35.2	32.9	-2.1	8.7	3.15	9.06	14.56
04/05/2010	23h 41m 02.39s	-03° 11' 58.1"	4.977587	5.5795710	46.40	49.1	35.3	33.0	-2.1	8.8	3.12	9.02	14.53
05/05/2010	23h 41m 46.00s	-03° 07' 27.6"	4.977407	5.5678153	46.31	49.8	35.4	33.1	-2.1	8.9	3.08	8.59	14.50
06/05/2010	23h 42m 29.30s	-03° 02' 59.1"	4.977229	5.5559241	46.21	50.6	35.4	33.1	-2.1	9.0	3.05	8.56	14.47
07/05/2010	23h 43m 12.27s	-02° 58' 32.8"	4.977050	5.5438991	46.11	51.4	35.5	33.2	-2.1	9.1	3.01	8.53	14.44
08/05/2010	23h 43m 54.91s	-02° 54' 08.7"	4.976873	5.5317424	46.01	52.2	35.6	33.3	-2.1	9.2	2.58	8.49	14.41
09/05/2010	23h 44m 37.22s	-02° 49' 46.8"	4.976696	5.5194557	45.90	52.9	35.7	33.4	-2.1	9.3	2.54	8.46	14.39
10/05/2010	23h 45m 19.19s	-02° 45' 27.2"	4.976519	5.5070413	45.80	53.7	35.8	33.4	-2.2	9.4	2.51	8.43	14.36
11/05/2010	23h 46m 00.81s	-02° 41' 09.8"	4.976343	5.4945011	45.70	54.5	35.8	33.5	-2.2	9.5	2.47	8.40	14.33
12/05/2010	23h 46m 42.09s	-02° 36' 54.8"	4.976167	5.4818374	45.59	55.3	35.9	33.6	-2.2	9.6	2.44	8.37	14.30
13/05/2010	23h 47m 23.01s	-02° 32' 42.2"	4.975992	5.4690524	45.48	56.1	36.0	33.7	-2.2	9.7	2.40	8.33	14.27
14/05/2010	23h 48m 03.57s	-02° 28' 32.0"	4.975817	5.4561486	45.38	56.8	36.1	33.8	-2.2	9.8	2.37	8.30	14.24
15/05/2010	23h 48m 43.76s	-02° 24' 24.2"	4.975643	5.4431284	45.27	57.6	36.2	33.8	-2.2	9.9	2.33	8.27	14.20
16/05/2010	23h 49m 23.59s	-02° 20' 19.0"	4.975470	5.4299945	45.16	58.4	36.3	33.9	-2.2	10.0	2.30	8.23	14.17
17/05/2010	23h 50m 03.03s	-02° 16' 16.3"	4.975297	5.4167494	45.05	59.2	36.4	34.0	-2.2	10.1	2.26	8.20	14.14
18/05/2010	23h 50m 42.08s	-02° 12' 16.2"	4.975124	5.4033960	44.94	60.0	36.4	34.1	-2.2	10.1	2.23	8.17	14.11
19/05/2010	23h 51m 20.74s	-02° 08' 18.8"	4.974952	5.3899370	44.83	60.8	36.5	34.2	-2.2	10.2	2.19	8.14	14.08
20/05/2010	23h 51m 59.00s	-02° 04' 24.1"	4.974781	5.3763752	44.71	61.6	36.6	34.3	-2.2	10.3	2.16	8.10	14.05
21/05/2010	23h 52m 36.86s	-02° 00' 32.1"	4.974610	5.3627132	44.60	62.4	36.7	34.3	-2.2	10.4	2.12	8.07	14.02
22/05/2010	23h 53m 14.30s	-01° 56' 42.9"	4.974439	5.3489538	44.49	63.1	36.8	34.4	-2.2	10.5	2.08	8.04	13.59
23/05/2010	23h 53m 51.33s	-01° 52' 56.5"	4.974269	5.3350995	44.37	63.9	36.9	34.5	-2.2	10.5	2.05	8.00	13.56
24/05/2010	23h 54m 27.95s	-01° 49' 12.9"	4.974100	5.3211529	44.25	64.7	37.0	34.6	-2.2	10.6	2.01	7.57	13.53
25/05/2010	23h 55m 04.14s	-01° 45' 32.1"	4.973931	5.3071165	44.14	65.5	37.1	34.7	-2.2	10.7	1.58	7.54	13.50
26/05/2010	23h 55m 39.91s	-01° 41' 54.1"	4.973763	5.2929926	44.02	66.3	37.2	34.8	-2.2	10.8	1.54	7.50	13.47
27/05/2010	23h 56m 15.25s	-01° 38' 19.1"	4.973595	5.2787836	43.90	67.1	37.3	34.9	-2.2	10.8	1.51	7.47	13.43
28/05/2010	23h 56m 50.16s	-01° 34' 47.0"	4.973428	5.2644918	43.78	67.9	37.4	35.0	-2.3	10.9	1.47	7.44	13.40
29/05/2010	23h 57m 24.63s	-01° 31' 17.9"	4.973261	5.2501195	43.66	68.7	37.5	35.1	-2.3	10.9	1.44	7.40	13.37
30/05/2010	23h 57m 58.65s	-01° 27' 51.9"	4.973095	5.2356690	43.54	69.6	37.6	35.2	-2.3	11.0	1.40	7.37	13.34
31/05/2010	23h 58m 32.21s	-01° 24' 28.9"	4.972929	5.2211428	43.42	70.4	37.7	35.3	-2.3	11.1	1.36	7.34	13.31
01/06/2010	23h 59m 05.32s	-01° 21' 09.0"	4.972764	5.2065431	43.30	71.2	37.8	35.4	-2.3	11.1	1.33	7.30	13.28
02/06/2010	23h 59m 37.95s	-01° 17' 52.4"	4.972599	5.1918726	43.18	72.0	37.9	35.5	-2.3	11.2	1.29	7.27	13.24
03/06/2010	00h 00m 10.11s	-01° 14' 38.9"	4.972435	5.1771338	43.06	72.8	38.0	35.6	-2.3	11.2	1.26	7.23	13.21
04/06/2010	00h 00m 41.79s	-01° 11' 28.7"	4.972271	5.1623292	42.93	73.6	38.1	35.7	-2.3	11.3	1.22	7.20	13.18
05/06/2010	00h 01m 12.98s	-01° 08' 21.8"	4.972108	5.1474617	42.81	74.4	38.3	35.8	-2.3	11.3	1.18	7.17	13.15
06/06/2010	00h 01m 43.68s	-01° 05' 18.3"	4.971946	5.1325340	42.69	75.2	38.4	35.9	-2.3	11.4	1.15	7.13	13.12
07/06/2010	00h 02m 13.88s	-01° 02' 18.1"	4.971783	5.1175489	42.56	76.1	38.5	36.0	-2.3	11.4	1.11	7.10	13.08
08/06/2010	00h 02m 43.57s	-00° 59' 21.4"	4.971622	5.1025095	42.44	76.9	38.6	36.1	-2.3	11.5	1.08	7.06	13.05
09/06/2010	00h 03m 12.76s	-00° 56' 28.2"	4.971461	5.0874188	42.31	77.7	38.7	36.2	-2.3	11.5	1.04	7.03	13.02
10/06/2010	00h 03m 41.42s	-00° 53' 38.4"	4.971301	5.0722799	42.18	78.5	38.8	36.3	-2.3	11.5	1.00	6.59	12.58
11/06/2010	00h 04m 09.57s	-00° 50' 52.2"	4.971141	5.0570960	42.06	79.4	38.9	36.4	-2.3	11.6	0.57	6.56	12.55
12/06/2010	00h 04m 37.18s	-00° 48' 09.6"	4.970981	5.0418707	41.93	80.2	39.1	36.5	-2.3	11.6	0.53	6.52	12.52
13/06/2010	00h 05m 04.26s	-00° 45' 30.6"	4.970822	5.0266072	41.80	81.0	39.2	36.6	-2.4	11.6	0.49	6.49	12.48
14/06/2010	00h 05m 30.79s	-00° 42' 55.2"	4.970664	5.0113093	41.68	81.9	39.3	36.7	-2.4	11.7	0.46	6.45	12.45
15/06/2010	00h 05m 56.76s	-00° 40' 23.7"	4.970506	4.9959805	41.55	82.7	39.4	36.9	-2.4	11.7	0.42	6.42	12.42
16/06/2010	00h 06m 22.17s	-00° 37' 55.9"	4.970349	4.9806244	41.42	83.6	39.5	37.0	-2.4	11.7	0.39	6.38	12.38
17/06/2010	00h 06m 47.02s	-00° 35' 31.9"	4.970192	4.9652447	41.29	84.4	39.7	37.1	-2.4	11.7	0.35	6.35	12.35
18/06/2010	00h 07m 11.29s	-00° 33' 11.8"	4.970036	4.9498450	41.17	85.3	39.8	37.2	-2.4	11.8	0.31	6.31	12.32
19/06/2010	00h 07m 34.98s	-00° 30' 55.5"	4.969880	4.9344288	41.04	86.1	39.9	37.3	-2.4	11.8	0.28	6.28	12.28
20/06/2010	00h 07m 58.10s	-00° 28' 43.1"	4.969725	4.9189994	40.91	87.0	40.0	37.4	-2.4	11.8	0.24	6.24	12.25
21/06/2010	00h 08m 20.63s	-00° 26' 34.6"	4.969570	4.9035603	40.78	87.8	40.2	37.6	-2.4	11.8	0.20	6.21	12.21
22/06/2010	00h 08m 42.58s	-00° 24' 30.											

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq.*	Diam. Pol.*	Mag.	Phase angle*	Rise	Transit	Set
22/07/2010	00h 14m 40.70s	+00° 04' 38.7"	4.965045	4.4391629	36.92	115.7	44.4	41.5	-2.6	10.6	22.19	4.25	10.27
23/07/2010	00h 14m 41.90s	+00° 04' 26.8"	4.964907	4.4253345	36.80	116.7	44.5	41.6	-2.6	10.5	22.15	4.21	10.23
24/07/2010	00h 14m 42.38s	+00° 04' 10.3"	4.964771	4.4116231	36.69	117.6	44.6	41.7	-2.6	10.4	22.11	4.17	10.20
25/07/2010	00h 14m 42.13s	+00° 03' 49.2"	4.964634	4.3980328	36.58	118.6	44.8	41.9	-2.6	10.4	22.07	4.13	10.16
26/07/2010	00h 14m 41.17s	+00° 03' 23.4"	4.964499	4.3845675	36.47	119.5	44.9	42.0	-2.6	10.3	22.03	4.09	10.12
27/07/2010	00h 14m 39.48s	+00° 02' 53.0"	4.964364	4.3712312	36.35	120.5	45.0	42.1	-2.7	10.2	21.59	4.05	10.08
28/07/2010	00h 14m 37.06s	+00° 02' 18.0"	4.964229	4.3580278	36.24	121.5	45.2	42.3	-2.7	10.0	21.55	4.01	10.04
29/07/2010	00h 14m 33.92s	+00° 01' 38.3"	4.964095	4.3449617	36.14	122.4	45.3	42.4	-2.7	9.9	21.51	3.97	10.00
30/07/2010	00h 14m 30.06s	+00° 00' 54.0"	4.963961	4.3320367	36.03	123.4	45.5	42.5	-2.7	9.8	21.47	3.93	9.95
31/07/2010	00h 14m 25.48s	+00° 00' 05.1"	4.963829	4.3192572	35.92	124.4	45.6	42.6	-2.7	9.7	21.43	3.49	9.91
01/08/2010	00h 14m 20.18s	-00° 00' 48.4"	4.963696	4.3066275	35.82	125.4	45.7	42.8	-2.7	9.6	21.39	3.45	9.87
02/08/2010	00h 14m 14.16s	-00° 01' 46.4"	4.963564	4.2941517	35.71	126.4	45.9	42.9	-2.7	9.5	21.35	3.41	9.83
03/08/2010	00h 14m 07.42s	-00° 02' 49.0"	4.963433	4.2818343	35.61	127.3	46.0	43.0	-2.7	9.4	21.31	3.37	9.99
04/08/2010	00h 13m 59.97s	-00° 03' 56.1"	4.963302	4.2696796	35.51	128.3	46.1	43.1	-2.7	9.2	21.27	3.33	9.95
05/08/2010	00h 13m 51.81s	-00° 05' 07.7"	4.963172	4.2576922	35.41	129.3	46.2	43.2	-2.7	9.1	21.23	3.29	9.91
06/08/2010	00h 13m 42.94s	-00° 06' 23.8"	4.963042	4.2458765	35.31	130.3	46.4	43.4	-2.7	9.0	21.19	3.25	9.87
07/08/2010	00h 13m 33.37s	-00° 07' 44.3"	4.962913	4.2342371	35.21	131.3	46.5	43.5	-2.7	8.8	21.15	3.21	9.83
08/08/2010	00h 13m 23.09s	-00° 09' 09.2"	4.962785	4.2227788	35.12	132.3	46.6	43.6	-2.7	8.7	21.11	3.17	9.81
09/08/2010	00h 13m 12.11s	-00° 10' 38.5"	4.962657	4.2115061	35.03	133.4	46.8	43.7	-2.8	8.5	21.07	3.13	9.74
10/08/2010	00h 13m 00.43s	-00° 12' 12.2"	4.962529	4.2004237	34.93	134.4	46.9	43.8	-2.8	8.4	21.03	3.09	9.70
11/08/2010	00h 12m 48.06s	-00° 13' 50.1"	4.962403	4.1895361	34.84	135.4	47.0	44.0	-2.8	8.2	20.59	3.05	9.66
12/08/2010	00h 12m 35.00s	-00° 15' 32.3"	4.962276	4.1788479	34.75	136.4	47.1	44.1	-2.8	8.1	20.55	3.00	9.61
13/08/2010	00h 12m 21.28s	-00° 17' 18.7"	4.962151	4.1683632	34.67	137.4	47.2	44.2	-2.8	7.9	20.51	2.96	9.57
14/08/2010	00h 12m 06.89s	-00° 19' 09.1"	4.962025	4.1580863	34.58	138.5	47.4	44.3	-2.8	7.8	20.47	2.92	9.53
15/08/2010	00h 11m 51.85s	-00° 21' 03.6"	4.961901	4.1480210	34.50	139.5	47.5	44.4	-2.8	7.6	20.43	2.88	9.49
16/08/2010	00h 11m 36.16s	-00° 23' 01.9"	4.961777	4.1381712	34.42	140.5	47.6	44.5	-2.8	7.5	20.39	2.84	9.44
17/08/2010	00h 11m 19.85s	-00° 25' 04.1"	4.961653	4.1285404	34.34	141.6	47.7	44.6	-2.8	7.3	20.35	2.79	9.40
18/08/2010	00h 11m 02.91s	-00° 27' 10.2"	4.961530	4.1191322	34.26	142.6	47.8	44.7	-2.8	7.1	20.31	2.75	9.36
19/08/2010	00h 10m 45.36s	-00° 29' 19.9"	4.961408	4.1099503	34.18	143.6	47.9	44.8	-2.8	6.9	20.27	2.71	9.31
20/08/2010	00h 10m 27.21s	-00° 31' 33.2"	4.961286	4.1009978	34.11	144.7	48.0	44.9	-2.8	6.8	20.23	2.67	9.27
21/08/2010	00h 10m 08.46s	-00° 33' 50.2"	4.961164	4.0922784	34.03	145.7	48.1	45.0	-2.8	6.6	20.18	2.63	9.22
22/08/2010	00h 09m 49.13s	-00° 36' 10.6"	4.961044	4.0837952	33.96	146.8	48.2	45.1	-2.8	6.4	20.14	2.58	9.18
23/08/2010	00h 09m 29.22s	-00° 38' 34.5"	4.960923	4.0755516	33.90	147.8	48.3	45.2	-2.8	6.2	20.10	2.54	9.14
24/08/2010	00h 09m 08.76s	-00° 41' 01.8"	4.960804	4.0675508	33.83	148.9	48.4	45.3	-2.8	6.0	20.06	2.50	9.09
25/08/2010	00h 08m 47.74s	-00° 43' 32.2"	4.960685	4.0597962	33.76	149.9	48.5	45.4	-2.9	5.9	20.02	2.45	9.05
26/08/2010	00h 08m 26.19s	-00° 46' 05.9"	4.960566	4.0522909	33.70	151.0	48.6	45.4	-2.9	5.7	19.58	2.41	9.00
27/08/2010	00h 08m 04.12s	-00° 48' 42.6"	4.960448	4.0450381	33.64	152.1	48.7	45.5	-2.9	5.5	19.54	2.37	8.96
28/08/2010	00h 07m 41.54s	-00° 51' 22.3"	4.960331	4.0380410	33.58	153.1	48.8	45.6	-2.9	5.3	19.50	2.33	8.91
29/08/2010	00h 07m 18.47s	-00° 54' 04.8"	4.960214	4.0313028	33.53	154.2	48.8	45.7	-2.9	5.1	19.45	2.28	8.87
30/08/2010	00h 06m 54.92s	-00° 56' 50.1"	4.960097	4.0248265	33.47	155.3	48.9	45.8	-2.9	4.9	19.41	2.24	8.82
31/08/2010	00h 06m 30.91s	-00° 59' 38.0"	4.959982	4.0186152	33.42	156.4	49.0	45.8	-2.9	4.7	19.37	2.19	8.78
01/09/2010	00h 06m 06.45s	-01° 02' 28.4"	4.959866	4.0126720	33.37	157.4	49.1	45.9	-2.9	4.5	19.33	2.15	8.73
02/09/2010	00h 05m 41.56s	-01° 05' 21.3"	4.959752	4.0070000	33.33	158.5	49.1	46.0	-2.9	4.3	19.29	2.11	8.69
03/09/2010	00h 05m 16.26s	-01° 08' 16.4"	4.959638	4.0016021	33.28	159.6	49.2	46.0	-2.9	4.1	19.24	2.07	8.64
04/09/2010	00h 04m 50.55s	-01° 11' 13.8"	4.959524	3.9964813	33.24	160.7	49.3	46.1	-2.9	3.9	19.20	2.02	8.60
05/09/2010	00h 04m 24.47s	-01° 14' 13.2"	4.959410	3.9916404	33.20	161.8	49.3	46.1	-2.9	3.6	19.16	1.98	8.55
06/09/2010	00h 03m 58.01s	-01° 17' 14.6"	4.959299	3.9870823	33.16	162.9	49.4	46.2	-2.9	3.4	19.12	1.94	8.51
07/09/2010	00h 03m 31.21s	-01° 20' 17.8"	4.959187	3.9828096	33.12	163.9	49.4	46.2	-2.9	3.2	19.08	1.90	8.46
08/09/2010	00h 03m 04.08s	-01° 23' 22.7"	4.959076	3.9788248	33.09	165.0	49.5	46.3	-2.9	3.0	19.04	1.85	8.41
09/09/2010	00h 02m 36.65s	-01° 26' 29.1"	4.958965	3.9751302	33.06	166.1	49.5	46.3	-2.9	2.8	18.59	1.80	8.36
10/09/2010	00h 02m 08.94s	-01° 29' 36.9"	4.958855	3.9717277	33.03	167.2	49.6	46.4	-2.9	2.6	18.55	1.76	8.31
11/09/2010	00h 01m 40.96s	-01° 32' 45.9"	4.958745	3.9686192	33.01	168.3	49.6	46.4	-2.9	2.4	18.51	1.72	8.26
12/09/2010	00h 01m 12.76s	-01° 35' 56.0"	4.958636	3.9658060	32.98	169.4	49.6	46.4	-2.9	2.1	18.47	1.67	8.21
13/09/2010	00h 00m 44.34s	-01° 39' 06.9"	4.958527	3.9632894	32.96	170.5	49.7	46.5	-2.9	1.9	18.42	1.62	8.16
14/09/2010	00h 00m 15.73s	-01° 42' 18.6"	4.958420	3.9610704	32.94	171.6	49.7	46.5	-2.9	1.7	18.38	1.58	8.11
15/09/2010	23h 59m 46.95s	-01° 45' 30.9"	4.958312	3.9591500	32.93	172.6	49.7	46.5	-2.9	1.5	18.34	1.54	8.06
16/09/2010	23h 59m 18.02s	-01° 48' 43.6"	4.958205	3.9575287	32.91	173.7	49.8	46.5	-2.9	1.3	18.30	1.50	8.01
17/09/2010	23h 58m 48.96s	-01° 51' 56.8"	4.958099	3.9562074	32.90	174.8	49.8	46.5	-2.9	1.1	18.26	1.45	7.96
18/09/2010	23h 58m 19.80s	-01° 55' 10.1"	4.957993	3.9551864	32.89	175.8	49.8	46.6	-2.9	0.8	18.21	1.40	7.91
19/09/2010	23h 57m 50.54s	-01° 58' 23.5"	4.957888	3.9544662	32.89	176.8	49.8	46.6	-2.9	0.6	18.17	1.36	7.86
20/09/2010	23h 57m 21.23s	-02° 01' 36.8"	4.957784	3.9540472	32.88	177.7	49.8	46.6	-2.9	0.5	18.13	1.32	7.81
21/09/2010	23h 56m 51.86s	-02° 04' 49.9"	4.957680	3.9539295	32.88	178.2	49.8	46.6	-2.9	0.4	18.09	1.28	7.76
22/09/2010	23h 56m 22.48s	-02° 08' 02.7"	4.957576	3.9541133	32.89	178.2	49.8	46.6	-2.9	0.4	18.04	1.24	7.71
23/09/2010	23h 55m 53.10s	-02° 11' 14.9"	4.957474	3.9545986	32.89	177.6	49.8	46.6	-2.9	0.5	18.00	1.20	7.66
24/09/2010	23h 55m 23.74s	-02° 14' 26.5"	4.957371	3.9553853	32.90	176.7	49.8	46.6	-2.9	0.7	17.56	1.16	7.61
25/09/2010	23h 54m 54.43s	-02° 17' 37.3"	4.957270	3.9564735	32.91	175.7	49.8	46.5	-2.9	0.9	17.52	1.12	7.56
26/09/2010	23h 54m 25.19s	-02° 20' 47.1"	4.957168	3.9578628	32.92	174.7	49.7	46.5	-2.9	1.1	17.48	1.08	7.51
27/09/2010	23h 53m 56.04s	-02° 23' 55.8"	4.957068	3.9595531	32.93	173.6	49.7	46.5	-2.9	1.3	17.43	1.04	7.46
28/09/2010	23h 53m 27.00s	-02° 27' 03.3"	4.956968	3.9615438	32.95	172.6	49.7	46.5	-2.9	1.5	17.39	1.00	7.41
29/09/2010	23h 52m 58.09s	-02° 30' 09.5"	4.956868	3.9638348	32.97	171.5	49.7	46.5	-2.9	1.7	17.35	0.96	7.36
30/09/2010	23h 52m 29.34s	-02° 33' 14.1"	4.956769	3.9664253	32.99	170.4	49.6	46.4	-2.9	1.9	17.31	0.92	7.31
01/10/2010	23h 52m 00.76s	-02° 36' 17.1"	4.956671	3.9693148	33.01	169.3	49.6	46.4	-2.9	2.2	17.27	0.88	7.26
02/10/2010	23h 51m 32.38s	-02° 39' 18.3"	4.956573	3.9725026	33.04	168.2	49.6	46.4	-2.9	2.4	17.22	0.84	7.21
03/10/2010	23h 51m 04.21s	-02° 42' 17.6"	4.956476	3.9759879	33.07	167.1	49.5	46.3	-2.9	2.6	17.18	0.80	7.16

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq.*	Diam. Pol.*	Mag.	Phase angle*	Rise	Transit	Set
03/11/2010	23h 40m 04.14s	-03° 48' 21.5"	4.953746	4.2189512	35.09	133.4	46.7	43.6	-2.8	8.4	15.09	20.58	2.50
04/11/2010	23h 39m 52.34s	-03° 49' 22.7"	4.953667	4.2305782	35.18	132.4	46.5	43.5	-2.8	8.5	15.05	20.53	2.46
05/11/2010	23h 39m 41.26s	-03° 50' 19.0"	4.953589	4.2424010	35.28	131.3	46.4	43.4	-2.7	8.6	15.01	20.49	2.42
06/11/2010	23h 39m 30.91s	-03° 51' 10.4"	4.953511	4.2544150	35.38	130.3	46.3	43.3	-2.7	8.8	14.57	20.45	2.38
07/11/2010	23h 39m 21.30s	-03° 51' 56.9"	4.953434	4.2666154	35.48	129.2	46.1	43.2	-2.7	8.9	14.53	20.41	2.33
08/11/2010	23h 39m 12.42s	-03° 52' 38.4"	4.953357	4.2789974	35.59	128.2	46.0	43.0	-2.7	9.0	14.49	20.37	2.29
09/11/2010	23h 39m 04.29s	-03° 53' 14.9"	4.953281	4.2915560	35.69	127.2	45.9	42.9	-2.7	9.2	14.45	20.33	2.25
10/11/2010	23h 38m 56.90s	-03° 53' 46.5"	4.953206	4.3042863	35.80	126.1	45.7	42.8	-2.7	9.3	14.41	20.29	2.21
11/11/2010	23h 38m 50.27s	-03° 54' 13.0"	4.953131	4.3171835	35.91	125.1	45.6	42.7	-2.7	9.4	14.37	20.25	2.17
12/11/2010	23h 38m 44.38s	-03° 54' 34.6"	4.953057	4.3302425	36.01	124.1	45.5	42.5	-2.7	9.5	14.33	20.21	2.13
13/11/2010	23h 38m 39.25s	-03° 54' 51.2"	4.952983	4.3434585	36.12	123.0	45.3	42.4	-2.7	9.6	14.29	20.17	2.09
14/11/2010	23h 38m 34.88s	-03° 55' 02.8"	4.952910	4.3568266	36.23	122.0	45.2	42.3	-2.7	9.8	14.25	20.13	2.05
15/11/2010	23h 38m 31.26s	-03° 55' 09.4"	4.952838	4.3703422	36.35	121.0	45.1	42.1	-2.7	9.9	14.21	20.09	2.01
16/11/2010	23h 38m 28.41s	-03° 55' 11.0"	4.952766	4.3840003	36.46	120.0	44.9	42.0	-2.7	10.0	14.17	20.05	1.97
17/11/2010	23h 38m 26.31s	-03° 55' 07.6"	4.952694	4.3977964	36.58	119.0	44.8	41.9	-2.6	10.1	14.13	20.01	1.93
18/11/2010	23h 38m 24.98s	-03° 54' 59.2"	4.952623	4.4117256	36.69	117.9	44.6	41.7	-2.6	10.2	14.09	19.57	1.89
19/11/2010	23h 38m 24.41s	-03° 54' 45.8"	4.952553	4.4257836	36.81	116.9	44.5	41.6	-2.6	10.2	14.05	19.53	1.85
20/11/2010	23h 38m 24.60s	-03° 54' 27.4"	4.952484	4.4399655	36.93	115.9	44.3	41.5	-2.6	10.3	14.01	19.49	1.81
21/11/2010	23h 38m 25.56s	-03° 54' 04.1"	4.952414	4.4542671	37.05	114.9	44.2	41.3	-2.6	10.4	13.57	19.45	1.77
22/11/2010	23h 38m 27.27s	-03° 53' 35.8"	4.952346	4.4686838	37.17	113.9	44.1	41.2	-2.6	10.5	13.53	19.41	1.73
23/11/2010	23h 38m 29.75s	-03° 53' 02.5"	4.952278	4.4832113	37.29	112.9	43.9	41.1	-2.6	10.6	13.49	19.38	1.70
24/11/2010	23h 38m 32.98s	-03° 52' 24.4"	4.952211	4.4978453	37.41	111.9	43.8	40.9	-2.6	10.7	13.45	19.34	1.66
25/11/2010	23h 38m 36.97s	-03° 51' 41.3"	4.952144	4.5125814	37.53	111.0	43.6	40.8	-2.6	10.7	13.42	19.30	1.62
26/11/2010	23h 38m 41.71s	-03° 50' 53.4"	4.952078	4.5274156	37.65	110.0	43.5	40.7	-2.6	10.8	13.38	19.26	1.58
27/11/2010	23h 38m 47.19s	-03° 50' 00.6"	4.952012	4.5423434	37.78	109.0	43.3	40.5	-2.6	10.9	13.34	19.22	1.54
28/11/2010	23h 38m 53.42s	-03° 49' 03.0"	4.951947	4.5573606	37.90	108.0	43.2	40.4	-2.6	10.9	13.30	19.18	1.51
29/11/2010	23h 39m 00.40s	-03° 48' 00.6"	4.951883	4.5724628	38.03	107.0	43.1	40.3	-2.6	11.0	13.26	19.15	1.47
30/11/2010	23h 39m 08.12s	-03° 46' 53.4"	4.951819	4.5876456	38.15	106.0	42.9	40.1	-2.6	11.0	13.22	19.11	1.43
01/12/2010	23h 39m 16.58s	-03° 45' 41.3"	4.951756	4.6029045	38.28	105.1	42.8	40.0	-2.5	11.1	13.18	19.07	1.39
02/12/2010	23h 39m 25.78s	-03° 44' 24.5"	4.951693	4.6182349	38.41	104.1	42.6	39.9	-2.5	11.1	13.14	19.03	1.35
03/12/2010	23h 39m 35.72s	-03° 43' 02.9"	4.951631	4.6336321	38.54	103.1	42.5	39.7	-2.5	11.2	13.11	18.59	1.31
04/12/2010	23h 39m 46.40s	-03° 41' 36.6"	4.951569	4.6490913	38.67	102.2	42.4	39.6	-2.5	11.2	13.07	18.56	1.27
05/12/2010	23h 39m 57.82s	-03° 40' 05.5"	4.951509	4.6646077	38.79	101.2	42.2	39.5	-2.5	11.3	13.03	18.52	1.23
06/12/2010	23h 40m 09.96s	-03° 38' 29.8"	4.951448	4.6801765	38.92	100.3	42.1	39.3	-2.5	11.3	12.59	18.48	1.19
07/12/2010	23h 40m 22.83s	-03° 36' 49.4"	4.951388	4.6957928	39.05	99.3	41.9	39.2	-2.5	11.3	12.55	18.44	1.15
08/12/2010	23h 40m 36.42s	-03° 35' 04.4"	4.951329	4.7114518	39.18	98.3	41.8	39.1	-2.5	11.4	12.51	18.41	1.11
09/12/2010	23h 40m 50.72s	-03° 33' 14.8"	4.951271	4.7271487	39.31	97.4	41.7	39.0	-2.5	11.4	12.48	18.37	1.07
10/12/2010	23h 41m 05.72s	-03° 31' 20.8"	4.951213	4.7428791	39.45	96.5	41.5	38.8	-2.5	11.4	12.44	18.33	1.03
11/12/2010	23h 41m 21.42s	-03° 29' 22.3"	4.951155	4.7586381	39.58	95.5	41.4	38.7	-2.5	11.4	12.40	18.30	0.99
12/12/2010	23h 41m 37.81s	-03° 27' 19.4"	4.951098	4.7744215	39.71	94.6	41.2	38.6	-2.5	11.4	12.36	18.26	0.95
13/12/2010	23h 41m 54.89s	-03° 25' 12.1"	4.951042	4.7902248	39.84	93.6	41.1	38.4	-2.5	11.4	12.33	18.22	0.91
14/12/2010	23h 42m 12.65s	-03° 23' 00.5"	4.950986	4.8060436	39.97	92.7	41.0	38.3	-2.5	11.5	12.29	18.19	0.87
15/12/2010	23h 42m 31.09s	-03° 20' 44.5"	4.950931	4.8218739	40.10	91.8	40.8	38.2	-2.5	11.5	12.25	18.15	0.83
16/12/2010	23h 42m 50.19s	-03° 18' 24.3"	4.950877	4.8377113	40.23	90.8	40.7	38.1	-2.4	11.5	12.21	18.12	0.79
17/12/2010	23h 43m 09.96s	-03° 15' 59.9"	4.950823	4.8535520	40.37	89.9	40.6	37.9	-2.4	11.5	12.18	18.08	0.75
18/12/2010	23h 43m 30.39s	-03° 13' 31.3"	4.950770	4.8693920	40.50	89.0	40.4	37.8	-2.4	11.5	12.14	18.04	0.71
19/12/2010	23h 43m 51.46s	-03° 10' 58.6"	4.950717	4.8852274	40.63	88.1	40.3	37.7	-2.4	11.5	12.10	18.01	0.67
20/12/2010	23h 44m 13.18s	-03° 08' 21.8"	4.950665	4.9010545	40.76	87.2	40.2	37.6	-2.4	11.4	12.06	17.57	0.63
21/12/2010	23h 44m 35.54s	-03° 05' 41.0"	4.950613	4.9168696	40.89	86.2	40.0	37.5	-2.4	11.4	12.03	17.54	0.59
22/12/2010	23h 44m 58.52s	-03° 02' 56.2"	4.950562	4.9326691	41.02	85.3	39.9	37.3	-2.4	11.4	11.59	17.50	0.55
23/12/2010	23h 45m 22.12s	-03° 00' 07.5"	4.950512	4.9484497	41.16	84.4	39.8	37.2	-2.4	11.4	11.55	17.47	0.51
24/12/2010	23h 45m 46.33s	-02° 57' 14.9"	4.950462	4.9642077	41.29	83.5	39.7	37.1	-2.4	11.4	11.51	17.43	0.47
25/12/2010	23h 46m 11.15s	-02° 54' 18.4"	4.950413	4.9799398	41.42	82.6	39.5	37.0	-2.4	11.4	11.48	17.40	0.43
26/12/2010	23h 46m 36.56s	-02° 51' 18.2"	4.950364	4.9956425	41.55	81.7	39.4	36.9	-2.4	11.3	11.44	17.36	0.39
27/12/2010	23h 47m 02.57s	-02° 48' 14.2"	4.950316	5.0113122	41.68	80.8	39.3	36.7	-2.4	11.3	11.40	17.33	0.35
28/12/2010	23h 47m 29.16s	-02° 45' 06.4"	4.950269	5.0269453	41.81	79.9	39.2	36.6	-2.4	11.3	11.37	17.29	0.31
29/12/2010	23h 47m 56.34s	-02° 41' 55.0"	4.950222	5.0425382	41.94	79.0	39.0	36.5	-2.4	11.2	11.33	17.26	0.27
30/12/2010	23h 48m 24.10s	-02° 38' 39.9"	4.950175	5.0580870	42.07	78.1	38.9	36.4	-2.4	11.2	11.29	17.22	0.23
31/12/2010	23h 48m 52.43s	-02° 35' 21.1"	4.950130	5.0735881	42.20	77.2	38.8	36.3	-2.3	11.2	11.26	17.19	0.19

A.R., Dec. = coordinate apparenti  
Distance = distanza dalla Terra in U.A.  
El. = elongazione dal Sole in °  
Mag. = magnitudine

R. = distanza dal Sole in U.A.  
Light = distanza in minuti-luce  
Diam. = diametro equatoriale e polare in "

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

A.R., Dec. = apparent coordinates  
Distance = distance from the Earth in A.U.  
El. = elongation from the Sun in °  
Mag. = magnitude

R. = distance from the Sun in A.U.  
Light = distance in minutes  
Diam. = equatorial and polar diameter in "

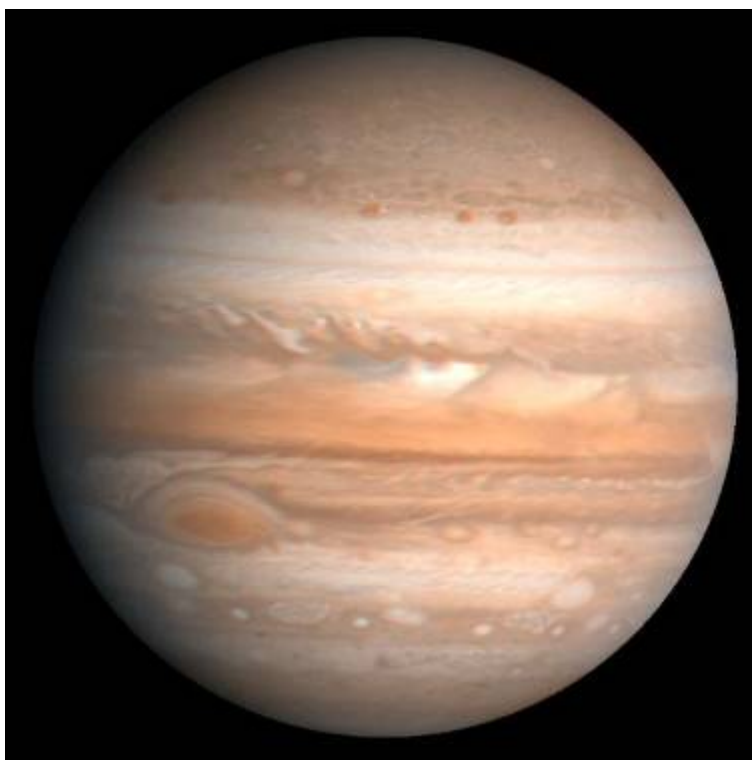
Times of rising and setting of the planet for Rome (42°N, 12°E), in U.T.+1



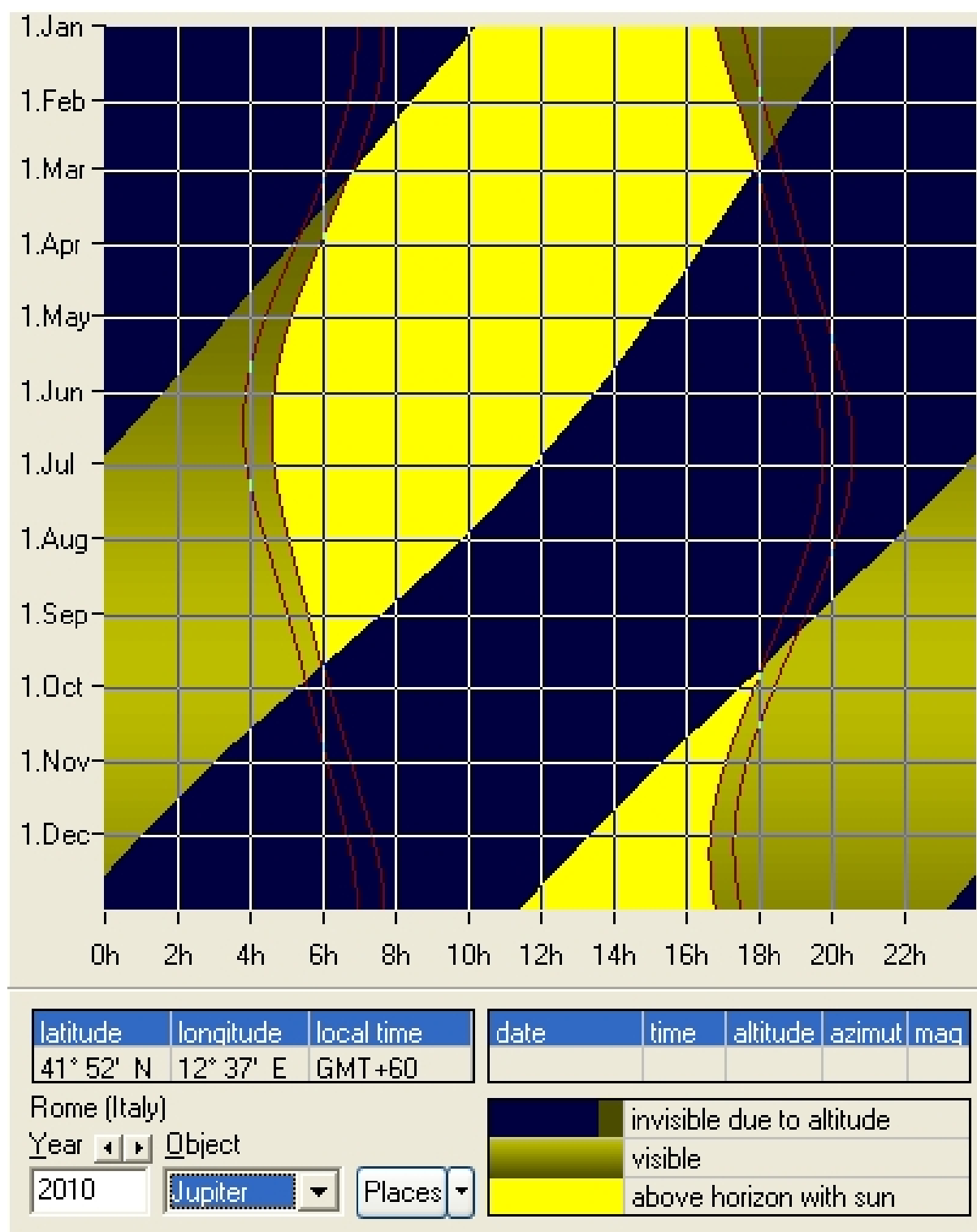
# FENOMENI DI GIOVE - PHENOMENA OF JUPITER

Perielio - Perihelion	Questo anno non avviene - No phenomenon			
Afelio - Aphelion	Questo anno non avviene - No phenomenon			
Perigeo - Perigee	20/09/2010	21.22.35	3.95393 AU	
Apogeo - Apogee	28/02/2010	14.01.03	5.98064 AU	
Magnit. Max - Brightness maximum	28/02/2010	18.09.38	-2.0	mag
Magnit. Max - Brightness maximum	21/09/2010	09.50.33	-2.9	mag
Magnit. Min - Brightness minimum	17/02/2010	10.03.03	-2.0	mag
Opposizione - Opposition	21/09/2010	11.35.54		
Congiunzione - Conjunction	28/02/2010	10.44.18		
Moto retrogr. - Retrograde motion	24/07/2010	03.53.17		
Moto diretto - Prograde motion	19/11/2010	05.57.12		
Max ang. Fase - Maximum phase angle	23/06/2010	22.47.52	11.8	°
Max ang. Fase - Maximum phase angle	16/12/2010	14.20.06	11.5	°
Min ang. Fase - Minimum phase angle	28/02/2010	12.15.20	0.2	°
Min ang. Fase - Minimum phase angle	21/09/2010	11.33.06	0.3	°
Estr. lat. Terra- Extremum lat. Earth	25/08/2010	00.50.44	2.44	°

© (5)



# VISIBILITA' DI GIOVE - VISIBILITY OF JUPITER



Visibilità di Giove nel corso dell'anno - Visibility of Jupiter during the year

Le righe rosse più esterne indicano in quali periodi dell'anno il pianeta è sufficientemente distante dal Sole per poter essere osservato agevolmente. Le date esatte sono riportate nelle tabelle seguenti.

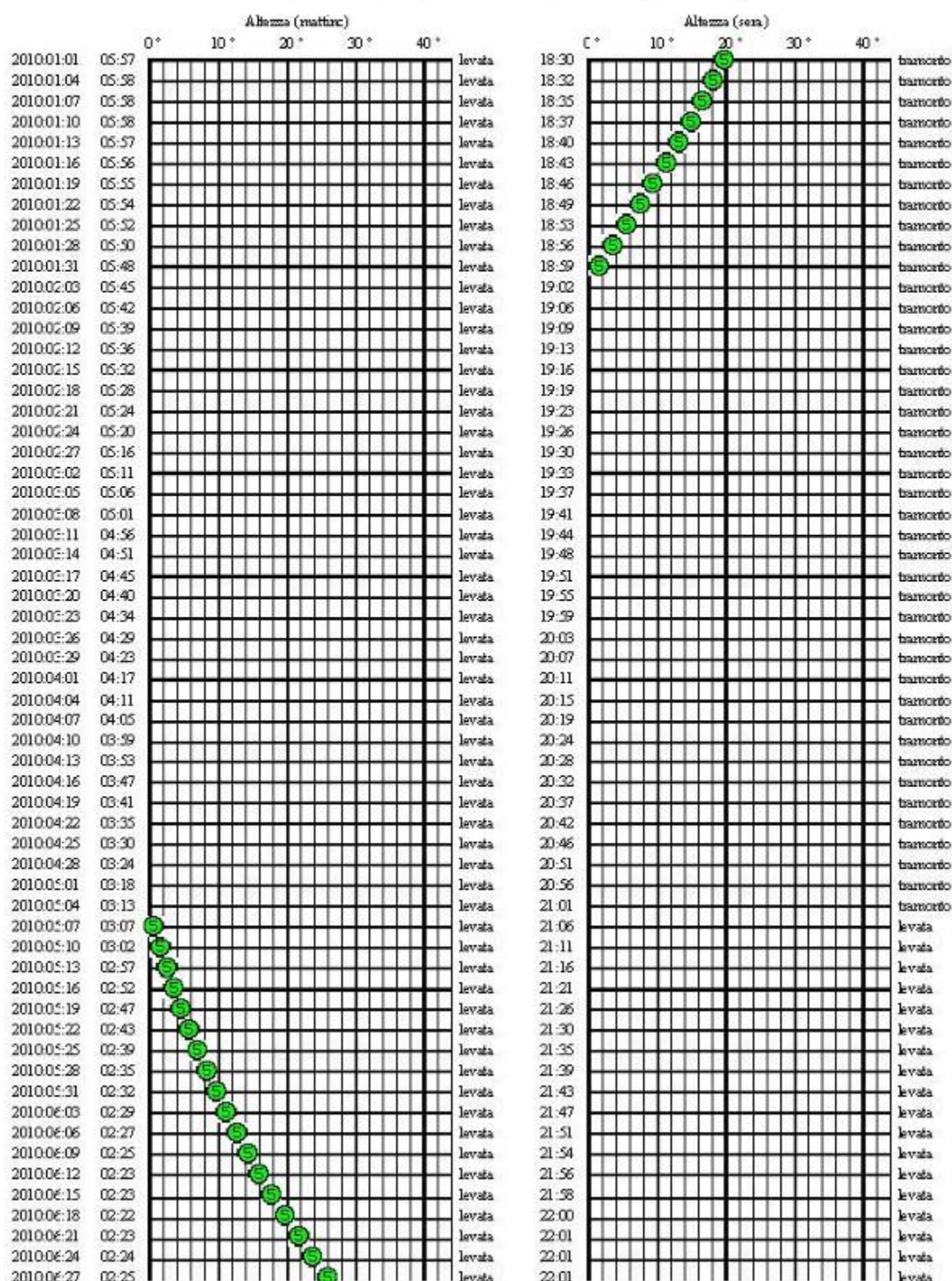
The external red lines show in what periods of the year the planet is sufficiently distant from the Sun to be able to be observed easily. The exact dates are in the following tables.

# Altezza ai crepuscoli

di Giove

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



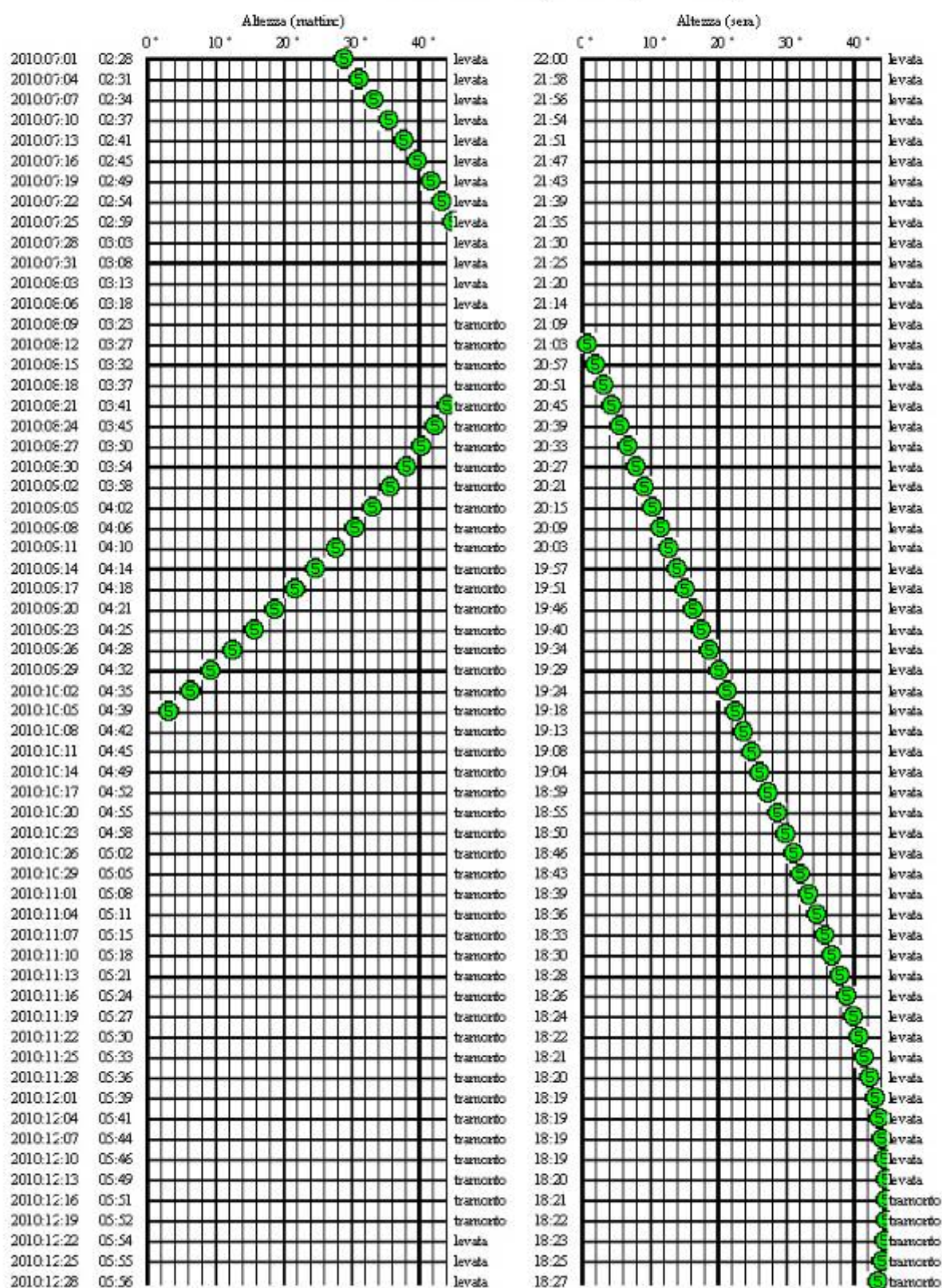


# Altezza ai crepuscoli

di Giove

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:01:01	05:57	-46.2	61.3	45.7	18:30	19.6	229.1	45.3
2010:01:04	05:58	-44.5	63.6	43.3	18:32	18.1	231.7	42.9
2010:01:07	05:58	-42.7	65.7	40.9	18:35	16.5	234.3	40.4
2010:01:10	05:58	-41.0	67.7	38.4	18:37	14.8	236.8	38.0
2010:01:13	05:57	-39.3	69.4	36.0	18:40	13.1	239.3	35.6
2010:01:16	05:56	-37.6	71.1	33.6	18:43	11.3	241.7	33.2
2010:01:19	05:55	-36.0	72.6	31.3	18:46	9.4	244.1	30.8
2010:01:22	05:54	-34.5	73.9	28.9	18:49	7.5	246.5	28.5
2010:01:25	05:52	-33.0	75.2	26.5	18:53	5.5	248.9	26.1
2010:01:28	05:50	-31.5	76.4	24.2	18:56	3.5	251.2	23.7
2010:01:31	05:48	-30.1	77.5	21.8	18:59	1.5	253.5	21.4
2010:02:03	05:45	-28.7	78.5	19.5	19:02	-0.6	255.8	19.0
2010:02:06	05:42	-27.4	79.5	17.1	19:06	-2.7	258.0	16.7
2010:02:09	05:39	-26.1	80.4	14.8	19:09	-4.8	260.3	14.4
2010:02:12	05:36	-24.9	81.2	12.5	19:13	-7.0	262.5	12.1
2010:02:15	05:32	-23.7	82.0	10.2	19:16	-9.1	264.8	9.8
2010:02:18	05:28	-22.6	82.7	7.9	19:19	-11.3	267.1	7.5
2010:02:21	05:24	-21.4	83.4	5.6	19:23	-13.4	269.4	5.2
2010:02:24	05:20	-20.4	84.0	3.4	19:26	-15.6	271.7	3.0
2010:02:27	05:16	-19.3	84.6	1.3	19:30	-17.8	274.0	1.1
2010:03:02	05:11	-18.3	85.1	1.6	19:33	-19.9	276.4	2.0
2010:03:05	05:06	-17.4	85.6	3.7	19:37	-22.1	278.9	4.2
2010:03:08	05:01	-16.4	86.1	6.0	19:41	-24.2	281.4	6.4
2010:03:11	04:56	-15.5	86.6	8.2	19:44	-26.3	284.0	8.7
2010:03:14	04:51	-14.6	87.0	10.5	19:48	-28.5	286.7	10.9
2010:03:17	04:45	-13.7	87.5	12.7	19:51	-30.5	289.5	13.2
2010:03:20	04:40	-12.9	87.9	15.0	19:55	-32.6	292.4	15.5
2010:03:23	04:34	-12.0	88.3	17.3	19:59	-34.6	295.4	17.7
2010:03:26	04:29	-11.2	88.7	19.5	20:03	-36.6	298.6	20.0
2010:03:29	04:23	-10.4	89.0	21.8	20:07	-38.5	302.0	22.3
2010:04:01	04:17	-9.6	89.4	24.0	20:11	-40.3	305.6	24.5
2010:04:04	04:11	-8.8	89.8	26.3	20:15	-42.1	309.3	26.8
2010:04:07	04:05	-8.0	90.1	28.6	20:19	-43.8	313.3	29.1
2010:04:10	03:59	-7.2	90.5	30.8	20:24	-45.3	317.6	31.4
2010:04:13	03:53	-6.4	90.9	33.1	20:28	-46.8	322.1	33.6
2010:04:16	03:47	-5.6	91.2	35.4	20:32	-48.0	326.8	35.9
2010:04:19	03:41	-4.8	91.6	37.7	20:37	-49.1	331.9	38.2
2010:04:22	03:35	-3.9	92.0	39.9	20:42	-50.0	337.1	40.5
2010:04:25	03:30	-3.1	92.5	42.2	20:46	-50.7	342.6	42.8
2010:04:28	03:24	-2.2	92.9	44.5	20:51	-51.2	348.3	45.1
2010:05:01	03:18	-1.4	93.4	46.8	20:56	-51.3	354.1	47.4
2010:05:04	03:13	-0.5	93.9	49.1	21:01	-51.3	359.9	49.7
2010:05:07	03:07	0.5	94.4	51.5	21:06	-50.9	5.7	52.0
2010:05:10	03:02	1.4	95.0	53.8	21:11	-50.3	11.4	54.4
2010:05:13	02:57	2.4	95.6	56.1	21:16	-49.4	17.0	56.7
2010:05:16	02:52	3.5	96.3	58.5	21:21	-48.3	22.3	59.1
2010:05:19	02:47	4.6	97.0	60.8	21:26	-46.9	27.4	61.5
2010:05:22	02:43	5.7	97.8	63.2	21:30	-45.4	32.3	63.8
2010:05:25	02:39	7.0	98.7	65.6	21:35	-43.7	36.8	66.2
2010:05:28	02:35	8.3	99.6	68.0	21:39	-41.8	41.0	68.6
2010:05:31	02:32	9.6	100.7	70.4	21:43	-39.9	45.0	71.1
2010:06:03	02:29	11.1	101.8	72.9	21:47	-37.8	48.6	73.5
2010:06:06	02:27	12.6	103.1	75.3	21:51	-35.7	52.0	76.0
2010:06:09	02:25	14.2	104.5	77.8	21:54	-33.6	55.2	78.4
2010:06:12	02:23	16.0	106.0	80.3	21:56	-31.5	58.1	80.9
2010:06:15	02:23	17.8	107.7	82.8	21:58	-29.4	60.8	83.5
2010:06:18	02:22	19.7	109.6	85.3	22:00	-27.3	63.3	86.0
2010:06:21	02:23	21.7	111.6	87.9	22:01	-25.3	65.7	88.6
2010:06:24	02:24	23.8	113.8	90.4	22:01	-23.3	67.8	91.1
2010:06:27	02:25	25.9	116.3	93.0	22:01	-21.4	69.8	93.8
2010:06:30	02:27	28.1	118.9	95.7	22:00	-19.5	71.7	96.4

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:07:01	02:28	28.9	119.9	96.6	22:00	-18.9	72.3	97.3
2010:07:04	02:31	31.1	122.9	99.2	21:58	-17.2	74.0	99.9
2010:07:07	02:34	33.3	126.2	101.9	21:56	-15.5	75.6	102.6
2010:07:10	02:37	35.5	129.8	104.6	21:54	-13.9	77.1	105.4
2010:07:13	02:41	37.7	133.7	107.4	21:51	-12.4	78.6	108.1
2010:07:16	02:45	39.7	138.0	110.1	21:47	-10.9	80.0	110.9
2010:07:19	02:49	41.6	142.6	113.0	21:43	-9.4	81.3	113.7
2010:07:22	02:54	43.3	147.6	115.8	21:39	-8.1	82.6	116.5
2010:07:25	02:59	44.9	152.9	118.7	21:35	-6.7	83.9	119.4
2010:07:28	03:03	46.1	158.6	121.6	21:30	-5.4	85.1	122.3
2010:07:31	03:08	47.1	164.5	124.5	21:25	-4.1	86.3	125.2
2010:08:03	03:13	47.7	170.7	127.4	21:20	-2.9	87.5	128.2
2010:08:06	03:18	48.0	177.1	130.4	21:14	-1.6	88.7	131.2
2010:08:09	03:23	47.9	183.5	133.5	21:09	-0.4	89.9	134.2
2010:08:12	03:27	47.4	189.8	136.5	21:03	0.8	91.1	137.3
2010:08:15	03:32	46.6	196.0	139.6	20:57	2.0	92.3	140.4
2010:08:18	03:37	45.5	202.0	142.7	20:51	3.2	93.5	143.5
2010:08:21	03:41	44.0	207.8	145.9	20:45	4.4	94.7	146.6
2010:08:24	03:45	42.3	213.2	149.0	20:39	5.5	96.0	149.8
2010:08:27	03:50	40.3	218.3	152.2	20:33	6.7	97.2	153.0
2010:08:30	03:54	38.1	223.0	155.4	20:27	7.9	98.5	156.2
2010:09:02	03:58	35.7	227.5	158.7	20:21	9.1	99.8	159.4
2010:09:05	04:02	33.1	231.7	161.9	20:15	10.3	101.2	162.6
2010:09:08	04:06	30.4	235.6	165.2	20:09	11.5	102.5	165.9
2010:09:11	04:10	27.6	239.3	168.4	20:03	12.7	103.9	169.2
2010:09:14	04:14	24.7	242.8	171.7	19:57	13.9	105.3	172.4
2010:09:17	04:18	21.7	246.1	174.9	19:51	15.1	106.8	175.6
2010:09:20	04:21	18.7	249.3	177.8	19:46	16.3	108.3	178.2
2010:09:23	04:25	15.6	252.3	177.6	19:40	17.6	109.8	177.0
2010:09:26	04:28	12.5	255.2	174.6	19:34	18.8	111.4	173.9
2010:09:29	04:32	9.4	258.0	171.3	19:29	20.0	113.0	170.6
2010:10:02	04:35	6.2	260.8	168.0	19:24	21.2	114.6	167.3
2010:10:05	04:39	3.1	263.5	164.7	19:18	22.5	116.3	164.0
2010:10:08	04:42	-0.1	266.1	161.4	19:13	23.7	118.0	160.7
2010:10:11	04:45	-3.3	268.8	158.1	19:08	24.9	119.8	157.4
2010:10:14	04:49	-6.4	271.4	154.8	19:04	26.2	121.7	154.1
2010:10:17	04:52	-9.5	274.1	151.5	18:59	27.4	123.6	150.9
2010:10:20	04:55	-12.6	276.7	148.2	18:55	28.6	125.5	147.6
2010:10:23	04:58	-15.6	279.5	145.0	18:50	29.8	127.6	144.4
2010:10:26	05:02	-18.6	282.2	141.8	18:46	31.0	129.7	141.1
2010:10:29	05:05	-21.5	285.1	138.6	18:43	32.2	131.9	137.9
2010:11:01	05:08	-24.4	288.0	135.4	18:39	33.4	134.2	134.8
2010:11:04	05:11	-27.2	291.1	132.2	18:36	34.5	136.5	131.6
2010:11:07	05:15	-29.9	294.2	129.1	18:33	35.7	139.0	128.5
2010:11:10	05:18	-32.5	297.5	125.9	18:30	36.8	141.6	125.4
2010:11:13	05:21	-35.0	301.0	122.9	18:28	37.8	144.3	122.3
2010:11:16	05:24	-37.3	304.7	119.8	18:26	38.8	147.1	119.2
2010:11:19	05:27	-39.6	308.5	116.8	18:24	39.8	150.1	116.2
2010:11:22	05:30	-41.7	312.5	113.7	18:22	40.7	153.2	113.2
2010:11:25	05:33	-43.6	316.7	110.8	18:21	41.6	156.5	110.2
2010:11:28	05:36	-45.3	321.2	107.8	18:20	42.4	159.8	107.3
2010:12:01	05:39	-46.8	325.8	104.9	18:19	43.1	163.4	104.4
2010:12:04	05:41	-48.1	330.6	102.0	18:19	43.7	167.1	101.5
2010:12:07	05:44	-49.2	335.5	99.1	18:19	44.1	170.9	98.6
2010:12:10	05:46	-50.1	340.5	96.3	18:19	44.5	174.8	95.8
2010:12:13	05:49	-50.7	345.6	93.4	18:20	44.7	178.9	93.0
2010:12:16	05:51	-51.1	350.7	90.7	18:21	44.8	183.0	90.2
2010:12:19	05:52	-51.2	355.7	87.9	18:22	44.7	187.2	87.4
2010:12:22	05:54	-51.2	0.6	85.1	18:23	44.5	191.4	84.7
2010:12:25	05:55	-50.9	5.3	82.4	18:25	44.1	195.7	81.9
2010:12:28	05:56	-50.5	9.8	79.7	18:27	43.6	199.9	79.3
2010:12:31	05:57	-49.9	14.1	77.1	18:29	42.8	204.1	76.6

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °



heliacal dates for Jupiter in 2010  
location : Rome (Italy)  
latitude : 41° 52' 12'' N  
longitude: 12° 37' 12'' E  
variable arcus visionis:  
arcvis [°] = 10.5 + 1.4 \* magnitude  
critical altitude: 0.00°

date eliache per Giove  
posizione : Roma  
latitudine : 41° 52' 12'' N  
longitudine: 12° 37' 12'' E

visibilità minima [°] = 10.5 + 1.4 \* magnitudine  
altezza critica : 0.00°

	date	obj r/s	sun r/s	d r/s	age	mag
last visibility	2010-02-16	18:25	17:43	0:42h	-11d 18h	-1.6
first visibility	2010-03-28	05:19	05:59	-0:40h	27d 17h	-1.6

Date : data nel formato mese/giorno  
Obj r/s : ora del tramonto o della levata del pianeta  
Sun r/s: ora del tramonto o della levata del Sole  
D r/s : differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due oggetti  
Age : giorni trascorsi dalla congiunzione col Sole  
Mag : magnitudine  
Morning visibility begins : inizio visibilità mattutina  
Morning visibility ends : fine visibilità mattutina  
Evening visibility begins : inizio visibilità serale  
Evening visibility ends : fine visibilità serale  
Last visibility : ultimo giorno di visibilità  
Firs visibilità : primo giorno di visibilità

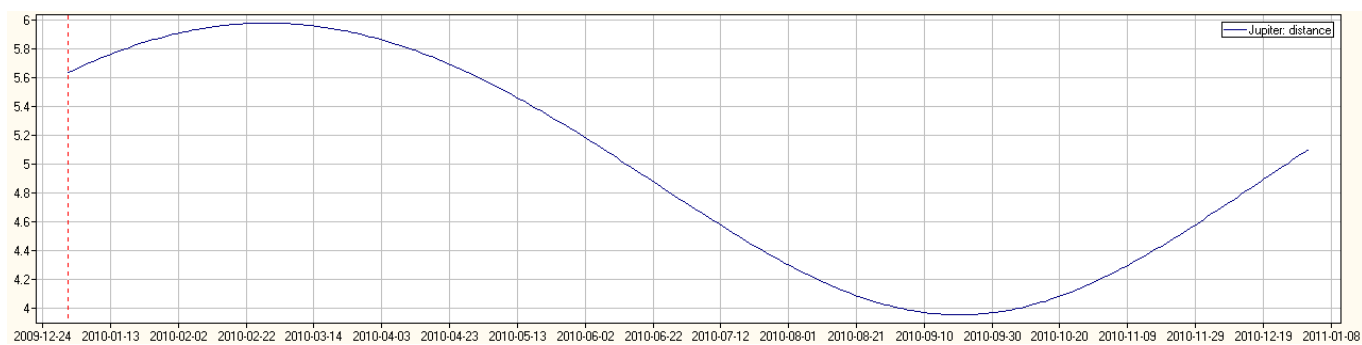
Obj r/s : rising and setting of the planet  
Sun r/s : sunrise and sunset  
D r/s : difference in hours and minutes between the instants of the rising or the setting of the two objects  
Age : days from the conjunction with the Sun  
Mag : magnitude

	date	obj r/s	sun r/s	sun alt	sun lon	obj lon	obj lat	mag	d az	d lon
L	02-16	18:25	17:43	-8° 30'	327° 56'	336° 54'	-0° 56'	-1.6	-4° 04'	8° 59'
F	03-28	05:19	05:59	-8° 19'	7° 23'	346° 22'	-0° 58'	-1.6	19° 35'	-21° 01'

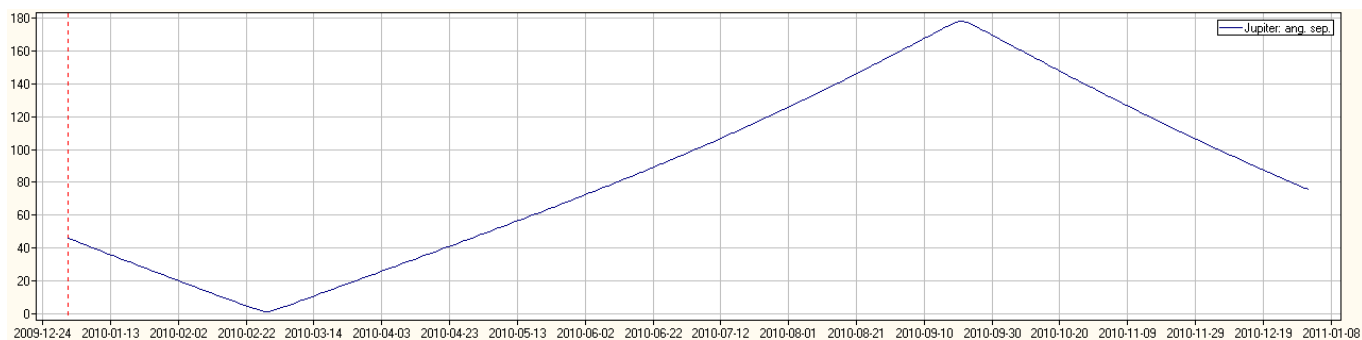
Date : data nel formato mese/giorno  
Sun alt : altezza del Sole nell'istante di visibilità del pianeta  
Sun lon : longitudine celeste del Sole  
Obj lon : longitudine celeste del pianeta  
Obj lat : latitudine celeste del pianeta  
Mag : magnitudine  
D az : differenza in azimut tra i centri del Sole e del pianeta nell'istante della sua visibilità  
D lon : differenza in longitudine tra i centri del Sole e del pianeta nell'istante della sua visibilità  
L = ultimo giorno di visibilità  
F = primo giorno di visibilità

Date : date in the format month/day  
Sun alt : altitude of the Sun in the instant of visibility of the planet  
Sun lon : celestial longitude of the Sun  
Obj lon : celestial longitude of the planet  
Obj lat : Celestial latitude of the planet  
Mag : magnitude  
D az : difference in azimuth between the centers of the Sun and the planet in the instant of its visibility  
D lon : difference in longitude between the centers of the Sun and the planet in the instant of its visibility

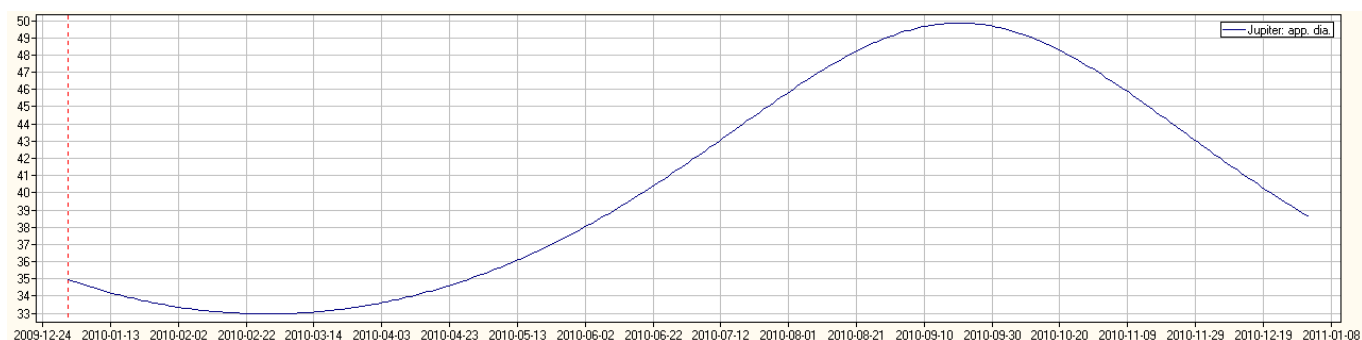
© (3)



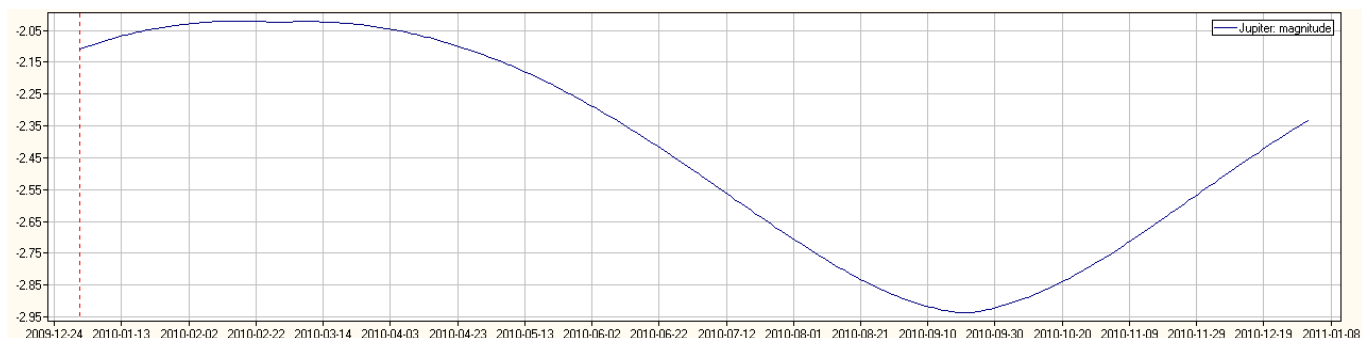
Distanza di Giove in U.A. nel corso dell'anno - Distance of Jupiter in A.U. during the year



Elongazione di Giove in ° nel corso dell'anno - Elongation of Jupiter in ° during the year



Diametro di Giove in " nel corso dell'anno - Diameter of Jupiter in " during the year



Magnitudine di Giove nel corso dell'anno - Magnitude of Jupiter during the year

# COORDINATE DEI SATELLITI DI GIOVE

## COORDINATES OF THE MOONS OF JUPITER

	I:x	I:y	I:z	II:x	II:y	II:z	III:x	III:y	III:z	IV:x	IV:y	IV:z
01/01/2010	5.4859	-0.0138	-2.1275	-8.9700	-0.0088	2.4912	-14.6448	0.0240	3.2491	-22.9093	0.0373	12.6689
02/01/2010	-5.9275	-0.0056	-0.2147	-0.0554	-0.0025	-9.3987	-11.9341	-0.0508	-9.1352	-26.0251	-0.0634	3.3366
03/01/2010	5.3030	0.0249	2.5554	9.4194	0.0092	1.0681	-0.6892	-0.0917	-15.0010	-25.5143	-0.1574	-6.4605
04/01/2010	-3.9390	-0.0403	-4.4193	-2.7531	0.0015	8.9351	11.0433	-0.0675	-10.1531	-21.4676	-0.2319	-15.3640
05/01/2010	1.7794	0.0499	5.6303	-8.0932	-0.0097	-4.6622	14.8373	0.0070	1.9696	-14.4620	-0.2762	-22.1581
06/01/2010	0.4948	-0.0513	-5.8784	6.2099	0.0003	-7.1567	7.9519	0.0792	12.6678	-5.4758	-0.2841	-25.9354
07/01/2010	-2.8578	0.0443	5.1883	5.9919	0.0107	7.2795	-4.6556	0.0961	14.2318	4.2556	-0.2538	-26.2025
08/01/2010	4.6132	-0.0300	-3.6548	-8.2579	-0.0023	4.2972	-13.9291	0.0431	5.5555	13.4104	-0.1889	-22.9421
09/01/2010	-5.7300	0.0104	1.5312	-2.4545	-0.0115	-9.0805	-13.2428	-0.0435	-7.1045	20.7520	-0.0976	-16.5976
10/01/2010	5.8199	0.0118	0.8720	9.4434	0.0055	-0.8802	-3.0919	-0.1021	-14.6974	25.2911	0.0086	-8.0196
11/01/2010	-5.0668	-0.0321	-3.0693	-0.8456	0.0117	9.3187	9.2665	-0.0886	-11.7989	26.4050	0.1156	1.6411
12/01/2010	3.3582	0.0484	4.8510	-8.8777	-0.0097	-2.8814	14.9656	-0.0099	-0.4516	23.9318	0.2090	11.0773
13/01/2010	-1.2644	-0.0566	-5.7665	4.6090	-0.0104	-8.2727	9.8943	0.0788	11.2144	18.1893	0.2758	18.9936
14/01/2010	-1.2054	0.0560	5.7963	7.3679	0.0142	5.8941	-2.2948	0.1130	14.7976	9.9471	0.3060	24.2870
15/01/2010	3.3240	-0.0462	-4.8591	-7.1819	0.0073	5.9243	-12.8442	0.0657	7.7364	0.3301	0.2945	26.1999
16/01/2010	-5.0264	0.0286	3.1469	-4.2751	-0.0187	-8.3707	-14.2153	-0.0314	-4.8688	-9.3316	0.2420	24.4490
17/01/2010	5.8159	-0.0055	-0.8936	9.0654	-0.0020	-2.8001	-5.4327	-0.1094	-14.0031	-17.6899	0.1546	19.2701
18/01/2010	-5.7484	-0.0185	-1.4429	1.1080	0.0215	9.2984	7.2321	-0.1107	-13.1427	-23.5805	0.0439	11.3911
19/01/2010	4.6402	0.0410	3.6365	-9.2767	-0.0057	-0.9684	14.6986	-0.0314	-2.8731	-26.1848	-0.0754	1.9205
20/01/2010	-2.9158	-0.0564	-5.1388	2.8045	-0.0222	-9.0389	11.5860	0.0736	9.4568	-25.1543	-0.1869	-7.8179
21/01/2010	0.5572	0.0637	5.8902	8.4336	0.0139	4.2477	0.1397	0.1282	14.9730	-20.6498	-0.2752	-16.4785
22/01/2010	1.7318	-0.0604	-5.6290	-5.7860	0.0192	7.2969	-11.4130	0.0910	9.7200	-13.3110	-0.3278	-22.8891
23/01/2010	-3.8759	0.0473	4.4869	-5.9143	-0.0230	-7.2958	-14.8119	-0.0139	-2.4981	-4.1551	-0.3372	-26.1948
24/01/2010	5.2872	-0.0257	-2.5820	8.2969	-0.0130	-4.6074	-7.6339	-0.1126	-12.9370	5.5666	-0.3014	-25.9687
25/01/2010	-5.9200	0.0000	0.3159	3.0222	0.0295	8.8704	5.0007	-0.1329	-14.1433	14.5346	-0.2245	-22.2530
26/01/2010	5.5073	0.0274	2.0936	-9.2679	0.0025	0.9925	14.0410	-0.0571	-5.2290	21.5417	-0.1160	-15.5509
27/01/2010	-4.3097	-0.0497	-4.0489	0.8748	-0.0337	-9.4172	12.9798	0.0628	7.4369	25.6398	0.0100	-6.7582
28/01/2010	2.2721	0.0657	5.4578	9.1381	0.0092	2.4108	2.5873	0.1405	14.7484	26.2676	0.1371	2.9476
29/01/2010	-0.0205	-0.0704	-5.8923	-4.1291	0.0325	8.3509	-9.6657	0.1182	11.4555	23.3233	0.2479	12.2490
30/01/2010	-2.3789	0.0643	5.4293	-7.2978	-0.0234	-5.8997	-15.0130	0.0090	-0.0476	17.1909	0.3269	19.8689
31/01/2010	4.2787	-0.0470	-4.0391	7.1681	-0.0268	-6.2210	-9.6382	-0.1105	-11.5208	8.6953	0.3625	24.7403
01/02/2010	-5.5639	0.0222	2.0496	4.8101	0.0344	8.0506	2.6278	-0.1537	-14.7698	-1.0037	0.3485	26.1687
02/02/2010	5.8782	0.0079	0.3602	-8.8480	0.0147	2.9136	13.0034	-0.0865	-7.4541	-10.5619	0.2858	23.9369
03/02/2010	-5.3190	-0.0360	-2.5935	-1.0969	-0.0437	-9.3876	14.0275	0.0457	5.2083	-18.6493	0.1819	18.3514
04/02/2010	3.7846	0.0605	4.5354	9.4474	-0.0002	0.4632	4.9692	0.1485	14.1224	-24.1382	0.0505	10.1987
05/02/2010	-1.7739	-0.0743	-5.6232	-2.2848	0.0458	9.0359	-7.6572	0.1460	12.8821	-26.2733	-0.0908	0.6229
06/02/2010	-0.6684	0.0772	5.8875	-8.3613	-0.0191	-4.2423	-14.8122	0.0371	2.4053	-24.7712	-0.2225	-9.0400
07/02/2010	2.8802	-0.0669	-5.1311	5.7257	-0.0424	-7.5688	-11.3885	-0.1022	-9.7951	-19.8584	-0.3265	-17.4630
08/02/2010	-4.7104	0.0460	3.6023	6.3916	0.0350	6.8727	0.1763	-0.1718	-15.0040	-12.2291	-0.3881	-23.5062
09/02/2010	5.7168	-0.0160	-1.4067	-8.0335	0.0302	4.7075	11.6099	-0.1187	-9.4894	-2.9353	-0.3985	-26.3712
10/02/2010	-5.8518	-0.0157	-0.9030	-3.0222	-0.0506	-8.9487	14.6997	0.0222	2.8256	6.7553	-0.3555	-25.6884
11/02/2010	4.9570	0.0476	3.2043	9.3452	-0.0140	-1.5098	7.2269	0.1507	13.1066	15.5347	-0.2639	-21.5592
12/02/2010	-3.3689	-0.0704	-4.8448	-0.3343	0.0575	9.3189	-5.4340	0.1730	13.9615	22.2174	-0.1354	-14.5392
13/02/2010	1.1024	0.0839	5.8186	-9.0555	-0.0096	-2.3964	-14.2108	0.0700	4.7980	25.9008	0.0137	-5.5636
14/02/2010	1.2185	-0.0828	-5.7576	4.0325	-0.0585	-8.5894	-12.8359	-0.0870	-7.8018	26.0757	0.1635	4.1625
15/02/2010	-3.4354	0.0689	4.8338	7.6945	0.0306	5.3880	-2.1856	-0.1856	-14.8329	22.7002	0.2936	13.3216
16/02/2010	5.0360	-0.0424	-3.0462	-6.8590	0.0481	6.2929	9.8967	-0.1523	-11.2685	16.2159	0.3858	20.6486
17/02/2010	-5.8594	0.0099	0.8703	-4.8160	-0.0532	-8.1180	14.9693	-0.0076	0.3668	7.4967	0.4265	25.1164
18/02/2010	5.6820	0.0270	1.5842	8.8343	-0.0318	-3.4199	9.2851	0.1463	11.7348	-2.2598	0.4086	26.0845
19/02/2010	-4.6605	-0.0580	-3.6276	1.6338	0.0662	9.1854	-3.0660	0.1976	14.6622	-11.7033	0.3334	23.4035
20/02/2010	2.7741	0.0824	5.2277	-9.3475	0.0050	-0.4440	-13.2268	0.1066	7.0633	-19.5161	0.2101	17.4456
21/02/2010	-0.5550	-0.0921	-5.8609	2.1618	-0.0734	-9.2367	-13.9411	-0.0644	-5.5933	-24.6133	0.0551	9.0491
22/02/2010	-1.8531	0.0882	5.6330	8.6595	0.0204	3.6624	-4.6974	-0.1936	-14.2594	-26.2959	-0.1106	-0.6045
23/02/2010	3.8972	-0.0686	-4.4083	-5.3772	0.0668	7.5963	7.9050	-0.1860	-12.7465	-24.3479	-0.2643	-10.1764
24/02/2010	-5.3413	0.0388	2.5661	-6.3972	-0.0505	-6.9314	14.8277	-0.0433	-2.1087	-19.0581	-0.3849	-18.3548
25/02/2010	5.8928	0.0001	-0.1780	7.9361	-0.0525	-5.1828	11.0910	0.1342	10.0400	-11.1664	-0.4554	-24.0402
26/02/2010	-5.5314	-0.0372	-2.0823	3.5312	0.0704	8.6409	-0.6141	0.2183	14.9640	-1.7602	-0.4656	-26.4813
27/02/2010	4.1957	0.0716	4.1676	-9.2236	0.0243	1.5266	-11.8838	0.1458	9.1388	7.8851	-0.4134	-25.3654
28/02/2010	-2.2782	-0.0928	-5.4320	0.1974	-0.0855	-9.4815	-14.6668	-0.0344	-3.2318	16.4672	-0.3048	-20.8497
01/03/2010	-0.1061	0.1009	5.9278	9.2431	0.0046	1.7729	-6.9760	-0.1945	-13.2975	22.8295	-0.1534	-13.5344
02/03/2010	2.4044	-0.0913	-5.3689	-3.6545	0.0847	8.5589	5.7024	-0.2179	-13.8727	26.1062	0.0211	-4.3970
03/03/2010	-4.3451	0.0680	4.0319	-7.6953	-0.0415	-5.4416	14.2829	-0.0839	-4.5200	25.8402	0.1955	5.3361
04/03/2010	5.5702	-0.0311	-1.9222	6.6910	-0.0746	-6.7195	12.5939	0.1139	8.0752	22.0500	0.3461	14.3386
05/03/2010	-5.9038	-0.0090	-0.3494	5.2717	0.0688	7.7100	1.8551	0.2333	14.8603	15.2320	0.4514	21.3660
06/03/2010	5.2389	0.0515	2.7345	-8.6892	0.0473	3.4272	-10.2168	0.1860	10.9706	6.3121	0.4959	25.4275
07/03/2010	-3.7943	-0.0835	-4.5110	-1.7743	-0.0931	-9.3130	-14.9954	0.0027	-0.7760	-3.4831	0.4721	25.9397
08/03/2010	1.6488	0.1048	5.6925	9.4194	-0.0166	-0.1954	-9.0684	-0.1871	-11.9703	-12.7920	0.3819	22.8225
09/03/2010	0.6941	-0.1075	-5.8412	-1.7698	0.1001	9.1368	3.3428	-0.2462	-14.6197	-20.3202	0.2367	16.5105
10/03/2010	-2.9615	0.0943	5.1366	-8.6527	-0.0262	-3.7149	13.3490	-0.1282	-6.8054	-25.0240	0.0559	7.8950
11/03/2010	4.7439	-0.0635	-3.4901	5.1539	-0.0965	-7.9630	13.7533	0.0853	5.8926	-26.2613	-0.1360	-1.8174
12/03/2010	-5.7459	0.0242	1.4143	6.7776	0.0606	6.4353	4.2724	0.2412	14.3513	-23.8813	-0.3127	-11.2800
13/03/2010	5.8103	0.0229	1.0580	-7.7694	0.0726	5.1716	-8.2740	0.2253	12.4992	-18.2290	-0.4497	-19.2040
14/03/2010	-4.9666	-0.0638	-3.1829	-3.6658	-0.0949	-8.7397	-14.9142	0.0459	1.6925	-10.0934	-0.5281	-24.5266
15/03/2010	3.2541	0.0981	4.9495	9.1814	-0.0422	-2.1552	-10.9064	-0.1709	-10.3247	-0.5874	-0.5364	-26.5437
16/03/2010	-1.0774	-0.1145	-5.7837	0.1921	0.1111	9.3053	0.9004	-0.2692	-14.9705	8.9976	-0.4727	-24.9983
17/03/2010	-1.3157	0.1144	5.7823	-9.2276	-0.0047	-1.8292	12.0563	-0.1747	-8.9033	17.3690	-0.3444	-20.0998
18/03/2010	3.4902	-0.0937	-4.7400	3.3943	-0.1163	-8.8591	14.5411	0.0484	3.5508	23.3961	-0.1679	-12.5016
19/03/2010	-5.0742	0.0596	3.0500	7.9821	0.0454	4.8755	6.5764	0.2405	13.4517	26.2545	0.0339	-3.2152
20/03/2010	5.8595	-0.0120	-0.7099	-6.5065	0.0984	6.6826	-6.1042	0.2621	13.6885	25.5421	0.2340	6.5057
21/03/2010	-5.6906	-0.0348	-1.5698	-5.3938	-0.0898							

	I:x	I:y	I:z	II:x	II:y	II:z	III:x	III:y	III:z	IV:x	IV:y	IV:z
14/04/2010	4.8788	0.0857	3.3620	-7.5099	0.1213	5.6004	4.1399	-0.3437	-14.4134	-26.0126	-0.2087	-4.3586
15/04/2010	-3.1642	-0.1261	-4.9595	-4.2380	-0.1392	-8.4920	13.7054	-0.1625	-6.0641	-22.7291	-0.4299	-13.5392
16/04/2010	0.9529	0.1488	5.8519	9.0013	-0.0758	-2.6754	13.4124	0.1390	6.6392	-16.3381	-0.5956	-20.8751
17/04/2010	1.4670	-0.1453	-5.7004	0.6372	0.1677	9.2883	3.4790	0.3440	14.5631	-7.7250	-0.6828	-25.3881
18/04/2010	-3.5621	0.1204	4.7248	-9.3613	0.0055	-1.2837	-8.9531	0.3031	12.0160	1.9355	-0.6788	-26.4818
19/04/2010	5.1745	-0.0722	-2.8469	2.8106	-0.1777	-9.0377	-14.9827	0.0422	0.8484	11.3362	-0.5832	-24.0171
20/04/2010	-5.8617	0.0155	0.6628	8.1855	0.0580	4.4564	-10.2983	-0.2538	-10.9283	19.2028	-0.4078	-18.3205
21/04/2010	5.6452	0.0488	1.7922	-6.1882	0.1538	7.0223	1.7626	-0.3716	-14.8927	24.4659	-0.1751	-10.1503
22/04/2010	-4.4837	-0.1023	-3.8119	-5.8787	-0.1245	-7.4509	12.5524	-0.2228	-8.1920	26.3964	0.0840	-0.6022
23/04/2010	2.6146	0.1426	5.3217	8.2687	-0.1142	-4.4701	14.3095	0.0893	4.3912	24.7134	0.3345	9.0287
24/04/2010	-0.2714	-0.1579	-5.8770	2.5428	0.1674	8.9529	5.7757	0.3407	13.8122	19.6255	0.5414	17.4117
25/04/2010	-2.0325	0.1496	5.5607	-9.4172	0.0446	0.6529	-6.9048	0.3491	13.2997	11.8189	0.6754	23.3725
26/04/2010	4.1141	-0.1139	-4.2304	0.9118	-0.1923	-9.4254	-14.6483	0.1052	3.2428	2.3691	0.7164	26.0612
27/04/2010	-5.4155	0.0627	2.3472	8.9342	0.0236	2.6750	-11.9172	-0.2187	-9.1366	-7.4115	0.6574	25.0920
28/04/2010	5.9200	0.0037	0.0737	-4.6111	0.1822	8.1364	-0.6485	-0.3900	-14.9816	-16.1569	0.5053	20.5983
29/04/2010	-5.4050	-0.0662	-2.3343	-2.7656	-0.1007	-6.1046	11.0813	-0.2820	-10.0932	-22.6520	0.2804	13.2189
30/04/2010	4.0450	0.1221	4.3349	7.1890	-0.1518	-6.0686	14.8318	0.0314	2.0450	-26.0012	0.0134	3.9977
01/05/2010	-1.9791	-0.1562	-5.5390	4.3292	0.1577	8.2361	7.9092	0.3259	12.7092	-25.7593	-0.2592	-5.7788
02/05/2010	-0.3331	0.1670	5.9141	-9.0790	0.0867	2.5496	-4.6932	0.3883	14.2299	-21.9777	-0.4998	-14.7644
03/05/2010	2.7012	-0.1484	-5.2406	-1.0161	-0.1983	-9.4197	-13.9399	0.1709	5.5320	-15.1907	-0.6753	-21.7431
04/05/2010	-4.5018	0.1082	3.8224	9.3000	-0.0169	0.7879	-13.2155	-0.1733	-7.1294	-6.3354	-0.7613	-25.7791
05/05/2010	5.6846	-0.0459	-1.6432	-2.8499	0.2045	8.9000	-3.0211	-0.3978	-14.6900	3.3810	-0.7452	-26.3407
06/05/2010	-5.8529	-0.0206	-0.6594	-8.3441	-0.0684	-4.5151	9.3403	-0.3380	-11.7245	12.6387	-0.6283	-23.3553
07/05/2010	5.1240	0.0882	2.9818	5.8139	-0.1863	-7.4060	14.9752	-0.0331	-0.3392	20.1830	-0.4251	-17.2185
08/05/2010	-3.5075	-0.1394	-4.7220	5.9224	0.1382	7.1744	9.8323	0.2992	11.2881	24.9786	-0.1620	-8.7485
09/05/2010	1.3880	0.1702	5.7609	-8.3674	0.1295	4.3281	-2.3723	0.4189	14.7930	26.3584	0.1256	0.9144
10/05/2010	1.0622	-0.1718	-5.7943	-2.8914	-0.1947	-9.0275	-12.8813	0.2373	7.6670	24.1142	0.3986	10.4486
11/05/2010	-3.2060	0.1474	4.9642	9.2736	-0.0616	-1.1215	-14.1695	-0.1184	-4.9577	18.5353	0.6189	18.5341
12/05/2010	4.9652	-0.0953	-3.2111	-0.9822	0.2187	9.2866	-5.2983	-0.3939	-14.0330	10.3797	0.7549	24.0295
13/05/2010	-5.7952	0.0309	1.0652	-9.0753	-0.0287	-2.7519	7.3780	-0.3886	-13.0496	0.7744	0.7863	26.1505
14/05/2010	5.7641	0.0433	1.3828	4.2066	-0.2152	-8.4312	14.7403	-0.1022	-2.6962	-8.9386	0.7073	24.5904
15/05/2010	-4.7267	-0.1081	-3.5028	7.2576	0.1092	5.8198	11.4895	0.2610	9.5953	-17.4047	0.5280	19.5705
16/05/2010	2.9842	0.1579	5.1213	-7.3194	0.1707	5.9158	-0.0179	0.4393	14.9789	-23.4444	0.2725	11.8060
17/05/2010	-0.6591	-0.1810	-5.8502	-4.6380	-0.1809	-8.2727	-11.5163	0.3020	9.5879	-26.2280	-0.0243	2.3929
18/05/2010	-1.6444	0.1760	5.6801	8.8637	-0.1082	-2.9731	-14.7657	-0.0554	-2.6873	-25.3862	-0.3213	-7.3517
19/05/2010	3.8295	-0.1398	-4.4986	0.9112	0.2234	9.2872	-7.4257	-0.3779	-13.0389	-21.0541	-0.5777	-16.0905
20/05/2010	-5.2447	0.0835	2.6911	-9.4357	0.0168	-0.8921	5.2482	-0.4317	-14.0451	-13.8416	-0.7581	-22.6387
21/05/2010	5.9174	-0.0091	-0.3234	2.4386	-0.2366	-9.1083	14.1424	-0.1741	-4.9717	-4.7404	-0.8374	-26.1209
22/05/2010	-5.5369	-0.0643	-1.9919	8.2845	0.0715	4.2348	12.8512	0.2118	7.6757	5.0046	-0.8039	-26.0745
23/05/2010	4.3231	0.1302	4.0570	-5.9852	0.2078	7.2512	2.3171	0.4481	14.7927	14.0695	-0.6612	-22.5071
24/05/2010	-2.3147	-0.1741	-5.4107	-6.1866	-0.1568	-7.1942	-9.8842	0.3627	11.2557	21.2174	-0.4273	-15.8934
25/05/2010	0.0471	0.1907	5.9168	8.0960	-0.1544	-4.6907	-14.9991	0.0139	-0.3742	25.4654	-0.1331	-7.1149
26/05/2010	2.3794	-0.1747	-5.4012	2.7520	0.2177	8.9101	-9.3535	-0.3497	-11.7391	26.2140	0.1816	2.6382
27/05/2010	-4.2564	0.1322	4.0826	-9.4194	0.0660	0.9875	3.0122	-0.4653	-14.6891	23.3399	0.4738	12.0267
28/05/2010	5.5787	-0.0643	-1.9924	0.5860	-0.2488	-9.4179	13.2075	-0.2461	-7.0982	17.2236	0.7022	19.7382
29/05/2010	-5.8766	-0.0116	-0.3218	8.9673	0.0266	2.4909	13.8849	0.1530	5.5965	8.7009	0.8340	24.6806
30/05/2010	5.2977	0.0889	2.6636	-4.4255	0.2386	8.2859	4.5663	0.4448	14.2555	-1.0408	0.8495	26.1434
31/05/2010	-3.7661	-0.1509	-4.5210	-7.4803	-0.1231	-5.8425	-8.0378	0.4174	12.6374	-10.6379	0.7452	23.9135
01/06/2010	1.7255	0.1892	5.6632	7.0101	-0.1976	-6.2079	-14.8766	0.0877	1.9249	-18.7446	0.5347	18.3124
02/06/2010	0.7411	-0.1962	-5.8499	4.4657	0.2010	8.1800	-11.0441	-0.3096	-10.1732	-24.2346	0.2469	10.1389
03/06/2010	-2.9208	0.1723	5.1279	-9.0364	0.1166	2.8109	0.7217	-0.4882	-14.9791	-26.3551	-0.0786	0.5504
04/06/2010	4.7840	-0.1174	-3.4869	-1.2753	-0.2506	-9.3571	11.9654	-0.3160	-9.0361	-24.8283	-0.3967	-9.1169
05/06/2010	-5.7261	0.0456	1.3651	9.2872	-0.0235	0.6625	14.5782	0.0860	3.4073	-19.8845	-0.6636	-17.5330
06/06/2010	5.8344	0.0371	1.0618	-2.7087	0.2610	8.9860	6.6820	0.4289	13.3901	-12.2144	-0.8423	-23.5597
07/06/2010	-4.8962	-0.1127	-3.2631	-8.4742	-0.0809	-4.2789	-6.0261	0.4640	13.7091	-2.8752	-0.9080	-26.3898
08/06/2010	3.2535	0.1711	4.9496	5.6581	-0.2354	-7.4392	-14.4096	0.1636	4.1520	6.8590	-0.8507	-25.6449
09/06/2010	-0.9466	-0.2017	-5.8159	5.9876	0.1738	7.1352	-12.4542	-0.2586	-8.3919	15.6572	-0.6772	-21.4238
10/06/2010	-1.3549	0.1997	5.7479	-8.3117	0.1661	4.5082	-1.5507	-0.4990	-14.9179	22.3134	-0.4100	-14.2869
11/06/2010	3.6067	-0.1635	-4.6878	-3.0709	-0.2412	-8.9387	10.4669	-0.3814	-10.7361	25.9041	-0.0846	-5.1954
12/06/2010	-5.1077	0.1022	2.9293	9.2412	-0.0766	-1.1743	14.9291	0.0130	1.1720	25.9156	0.2545	4.6138
13/06/2010	5.8982	-0.0210	-0.6142	-0.9063	0.2735	9.3332	8.6197	0.4006	12.2315	22.3267	0.5604	13.7801
14/06/2010	-5.6182	-0.0625	-1.7476	-9.1387	-0.0319	-2.5696	-3.9003	0.5010	14.4586	15.6182	0.7898	21.0136
15/06/2010	4.5104	0.1371	3.8435	4.1014	-0.2657	-8.4324	-13.6213	0.2397	6.2629	6.7205	0.9093	25.2828
16/06/2010	-2.5450	-0.1900	-5.3114	7.2623	0.1368	5.8267	-13.5664	-0.1979	-6.4392	-3.1231	0.9011	25.9718
17/06/2010	0.3095	0.2114	5.9014	-7.2836	0.2120	6.0173	-3.7598	-0.4973	-14.5199	-12.5277	0.7652	22.9816
18/06/2010	2.1494	-0.1980	-5.5041	-4.7340	-0.2208	-8.1897	8.7538	-0.4401	-12.1708	-20.1736	0.5199	16.7414
19/06/2010	-4.0819	0.1530	4.2466	8.8421	-0.1301	-2.9474	14.9423	-0.0642	-1.0573	-24.9972	0.1991	8.1467
20/06/2010	5.4936	-0.0804	-2.2286	0.9085	0.2751	9.3246	10.3390	0.3605	10.8164	-26.3389	-0.1526	-1.5887
21/06/2010	-5.8826	-0.0043	-0.1029	-9.4588	0.0217	-0.7849	-1.7195	0.5268	14.8746	-24.0306	-0.4867	-11.1073
22/06/2010	5.4022	0.0897	2.4419	-2.4062	-0.2866	-9.0700	-12.5449	0.3130	8.1994	-18.4046	-0.7567	-19.1017
23/06/2010	-3.9271	-0.1614	-4.3870	8.2489	0.0915	4.3130	-14.3614	-0.1294	-4.3805	-10.2484	-0.9253	-24.4874
24/06/2010	1.9375	0.2058	5.5870	-6.0010	0.2518	7.2870	-5.8491	-0.4829	-13.8147	-0.6852	-0.9687	-26.5395
25/06/2010	0.5344	-0.2174	-5.8793	-6.2053	-0.1899	-7.1499	6.8786	-0.4905	-13.3207	8.9731	-0.8801	-24.9839
26/06/2010	-2.7405	0.1933	5.2175	8.1170	-0.1814	-4.5908	14.6337	-0.1433	-3.2328	17.4011	-0.6706	-20.0232
27/06/2010	4.6631	-0.1359	-3.6556	2.6675	0.2652	8.9723	11.8146	0.3095	9.1857	23.4343	-0.3679	-12.3231
28/06/2010	-5.6789	0.0570	1.5369	-9.4346	0.0775	1.0068	0.4715	0.5406	14.9642	26.2264	-0.0128	-2.9261
29/06/2010	5.8676	0.0327	0.8617	0.6419	-0.2969	-9.3693	-11.2134	0.3817	9.9331	25.3750	0.3458	6.8755
30/06/2010	-4.9884	-0.1180	-3.1254	8.9194	0.0398	2.6592	-14.8374	-0.0550	-2.2607	20.9766	0.6577	15.7137
01/07/2010	3.4027	0.1829	4.8411	-4.5198	0.2837	8.2789	-7.7803	-0.4562	-12.8305	13.6328	0.8784	22.3350
02/07/2010	-1.1083	-0.2197	-5.7941</									

	I:x	I:y	I:z	II:x	II:y	II:z	III:x	III:y	III:z	IV:x	IV:y	IV:z
04/08/2010	-4.0655	0.1744	4.2486	7.5206	-0.2310	-5.4910	-12.8948	0.3290	7.6341	8.2265	1.0316	24.8272
05/08/2010	5.4773	-0.0937	-2.2775	3.7324	-0.2832	8.6186	-14.1478	-0.1754	-5.0419	-1.6232	1.0489	26.1032
06/08/2010	-5.8849	-0.0050	-0.1236	-9.2310	0.1237	2.1783	-5.1798	-0.5556	-14.0831	-11.2432	0.9158	23.6286
07/08/2010	5.4022	0.0997	2.4207	-0.4350	-0.3273	-9.3478	7.5386	-0.5351	-12.9618	-19.2635	0.6509	17.7658
08/08/2010	-3.9094	-0.1824	-4.4191	9.1709	0.0127	1.6856	14.7786	-0.1267	-2.4641	-24.5539	0.2919	9.3664
09/08/2010	1.9040	0.2305	5.5822	-3.5283	0.3276	8.7766	11.2806	0.3735	9.8190	-26.3766	-0.1103	-0.3626
10/08/2010	0.5751	-0.2438	-5.8884	-8.0395	-0.1345	-4.9594	-0.4023	0.6021	14.9584	-24.4903	-0.4990	-10.0460
11/08/2010	-2.8078	0.2139	5.1680	6.4441	-0.2709	-6.7236	-11.7988	0.3937	9.2299	-19.1732	-0.8197	-18.3298
12/08/2010	4.6990	-0.1501	-3.6189	5.1644	0.2511	7.8348	-14.6733	-0.1014	-3.1892	-11.1782	-1.0275	-24.0744
13/08/2010	-5.7093	0.0590	1.4196	-8.7212	0.1763	3.7247	-6.9401	-0.5254	-13.3083	-1.6256	-1.0935	-26.4942
14/08/2010	5.8495	0.0389	0.9389	-2.0488	-0.3144	-9.1398	5.8220	-0.5702	-13.8183	8.1560	-1.0081	-25.2593
15/08/2010	-4.9224	-0.1349	-3.2483	9.3216	-0.0448	0.0695	14.3502	-0.2019	-4.3298	16.8008	-0.7829	-20.5336
16/08/2010	3.2910	0.2036	4.9001	-1.9790	0.3383	9.2444	12.4463	0.3125	8.2984	23.0984	-0.4486	-12.9580
17/08/2010	-0.9681	-0.2428	-5.8330	-8.7724	-0.0810	-3.5217	1.5059	0.5990	14.8861	26.1546	-0.0517	-3.5748
18/08/2010	-1.3675	0.2381	5.7226	5.1881	-0.3017	-7.7359	-10.5288	0.4503	10.6473	25.5248	0.3520	6.3112
19/08/2010	3.6092	-0.1961	-4.7034	6.4224	0.2106	6.8307	-14.9507	-0.0259	-1.3204	21.2795	0.7054	15.2991
20/08/2010	-5.1428	0.1189	2.8517	-7.9663	0.2231	5.1422	-8.5540	-0.4852	-12.3370	14.0057	0.9577	22.0985
21/08/2010	5.8983	-0.0249	-0.5940	-3.5814	-0.2910	-8.6653	4.0454	-0.5941	-14.4397	4.7332	1.0725	25.7184
22/08/2010	-5.5910	-0.0777	-1.8668	9.1938	-0.1005	-1.5259	13.7006	-0.2725	-6.0922	-5.2180	1.0330	25.6286
23/08/2010	4.4448	0.1621	3.8917	-0.3951	0.3379	9.4396	13.3905	0.2460	6.6747	-14.4247	0.8446	21.8418
24/08/2010	-2.4329	-0.2247	-5.3859	-9.2443	-0.0250	-2.0008	3.3496	0.5844	14.5792	-21.5753	0.5344	14.9108
25/08/2010	0.1545	0.2452	5.8848	3.7948	-0.3224	-8.5088	-9.1228	0.4975	11.8684	-25.6567	0.1469	5.8456
26/08/2010	2.2873	-0.2281	-5.4660	7.4784	0.1635	5.6429	-14.9936	0.0489	0.5310	-26.1034	-0.2626	-4.0532
27/08/2010	-4.2329	0.1701	4.0798	-6.9969	0.2624	6.3966	-10.0088	-0.4365	-11.1960	-22.8683	-0.6361	-13.3836
28/08/2010	5.5551	-0.0867	-2.0764	-4.9935	-0.2583	-7.9479	2.2339	-0.6066	-14.8323	-16.4178	-0.9213	-20.8457
29/08/2010	-5.8789	-0.0153	-0.3706	8.8013	-0.1525	-3.0581	12.8493	-0.3373	-7.7378	-7.6672	-1.0783	-25.4096
30/08/2010	5.2956	0.1095	2.6310	1.1803	0.3268	9.3672	14.1159	0.1757	4.9687	2.1565	-1.0854	-26.4521
31/08/2010	-3.7252	-0.1910	-4.5848	-9.4521	0.0310	-0.4409	5.1157	0.5590	14.0516	11.6775	-0.9416	-23.8319
01/09/2010	1.6566	0.2351	5.6529	2.3077	-0.3323	-0.0295	-7.6010	0.5347	12.8901	19.5647	-0.6669	-17.9026
02/09/2010	0.8236	-0.2442	-5.8642	8.3113	0.1119	4.3091	-14.8120	0.1215	2.3457	24.7043	-0.2997	-9.4765
03/09/2010	-3.0464	0.2090	5.0279	-5.8452	0.2929	7.4616	-11.2932	-0.3806	-9.9049	26.3605	0.1086	0.2809
04/09/2010	4.8500	-0.1420	-3.4140	-6.2519	-0.2179	-7.0148	0.4154	-0.6076	-14.9968	24.2842	0.5000	9.9961
05/09/2010	-5.7748	0.0475	1.1411	8.1632	-0.1987	-4.4876	11.8182	-0.3944	-9.2398	18.7520	0.8190	18.2846
06/09/2010	5.7948	0.0498	1.2042	2.7069	0.3057	9.0376	14.6184	0.1037	3.2183	10.5408	1.0196	23.9437
07/09/2010	-4.7649	-0.1445	-3.4873	-9.3992	0.0852	1.1180	6.7776	0.5239	13.3262	0.8177	1.0727	26.1425
08/09/2010	3.0425	0.2089	5.0493	0.7679	-0.3314	-9.2925	-5.9911	0.5614	13.7100	-9.0219	0.9709	24.5571
09/09/2010	-0.6861	-0.2433	-5.8789	8.9057	0.0577	2.8681	-14.4191	0.1904	4.1060	-17.5695	0.7290	19.4198
10/09/2010	-1.6642	0.2329	5.6395	-4.5455	0.3137	8.3154	-12.4029	-0.3190	-8.4821	-23.6054	0.3822	11.4853
11/09/2010	3.8332	-0.1869	-4.5247	-7.3295	-0.1715	-5.8952	-1.3964	-0.5976	-14.9417	-26.2768	-0.0195	1.9039
12/09/2010	-5.2910	0.1061	2.5711	7.3013	-0.2376	-5.7817	10.6201	-0.4433	-10.5948	-25.2198	-0.4185	-7.9486
13/09/2010	5.9160	-0.0123	-0.2961	4.1487	0.2756	8.4648	14.9018	0.0313	1.4361	-20.5991	-0.7586	-16.6832
14/09/2010	-5.4892	-0.0890	-2.1666	-9.0931	0.1354	2.6373	8.3257	0.4802	12.4142	-13.0800	-0.9922	-23.0859
15/09/2010	4.2261	0.1688	4.1172	-0.7849	-0.3202	-9.2970	-4.3092	0.5774	14.3261	-3.7233	-1.0869	-26.2760
16/09/2010	-2.1466	-0.2261	-5.5133	9.2521	0.0031	1.3564	-13.8221	0.2543	5.7938	6.1551	-1.0301	-25.8191
17/09/2010	-0.1761	0.2404	5.8794	-3.1308	0.3244	8.9423	-13.3230	-0.2532	-6.9494	15.1714	-0.8299	-21.7766
18/09/2010	2.5713	-0.2184	-5.3415	-8.2035	-0.1211	-4.6195	-3.1692	-0.5772	-14.6721	22.0587	-0.5149	-14.7031
19/09/2010	-4.4615	0.1562	3.8297	6.2406	-0.2681	-6.9105	9.2816	-0.4830	-11.7850	25.8405	-0.1293	-5.5701
20/09/2010	5.6548	-0.0724	-1.7755	5.4732	0.2379	7.6658	14.9714	-0.0396	-0.3525	25.9701	0.2725	4.3465
21/09/2010	-5.8544	-0.0286	-0.7068	-8.5445	0.1802	4.0828	9.7491	0.4293	11.3307	22.4111	0.6332	13.6427
22/09/2010	5.1346	0.1182	2.9175	-2.3133	-0.2994	-9.0462	-2.5690	0.5831	14.7386	15.6580	0.9015	20.9821
23/09/2010	-3.4668	-0.1940	-4.7917	9.3445	-0.0500	-0.1883	-13.0285	0.3124	7.4011	6.6637	1.0389	25.2947
24/09/2010	1.3235	0.2315	5.7343	-1.6352	0.3251	9.3297	-14.0532	-0.1844	-5.3148	-3.2854	1.0258	25.9463
25/09/2010	1.1435	-0.2346	-5.8145	-8.8556	-0.0683	-3.2185	-4.8968	-0.5472	-14.1913	-12.7622	0.8646	22.8376
26/09/2010	-3.3394	0.1946	4.8376	5.0075	-0.2894	-7.8484	7.8114	-0.5132	-12.8049	-20.4088	0.5791	16.4291
27/09/2010	5.0282	-0.1263	-3.1419	6.6496	0.1942	6.6605	14.8276	-0.1080	-2.1345	-25.1371	0.2109	7.6563
28/09/2010	-5.8375	0.0322	0.8002	-7.7674	0.2183	5.4206	11.0348	0.3723	10.0843	-26.2868	-0.1868	-2.2117
29/09/2010	5.7111	0.0609	1.5257	-3.7810	-0.2701	-8.5464	-0.7906	0.5786	14.9388	-23.7079	-0.5574	-11.7691
30/09/2010	-4.5634	-0.1498	-3.7583	9.1803	-0.1000	-1.7301	-12.0480	0.3634	8.9006	-17.7827	-0.8489	-19.6746
01/10/2010	2.7400	0.2071	5.2125	-0.0930	0.3162	9.4680	-14.5814	-0.1147	-3.6066	-9.3559	-1.0208	-24.8337
02/10/2010	-0.3615	-0.2348	-5.9128	-9.2695	-0.0153	-1.7256	-6.5544	-0.5090	-13.5101	0.3828	-1.0499	-26.5429
03/10/2010	-1.9947	0.2187	5.5293	3.6314	-0.3012	-8.5716	6.2267	-0.5340	-13.6466	10.0680	-0.9328	-24.5687
04/10/2010	4.0733	-0.1703	-4.3091	7.6495	0.1462	5.4707	14.4721	-0.1728	-3.8965	18.3421	-0.6866	-19.1837
05/10/2010	-5.4366	0.0890	2.2592	-6.7779	0.2486	6.6192	12.1736	0.3105	8.6825	24.0401	-0.3461	-11.1256
06/10/2010	5.9168	0.0010	0.0284	-5.1515	-0.2336	-7.8079	1.0172	0.5645	14.9242	26.3544	0.0404	-1.5109
07/10/2010	-5.3649	-0.0969	-2.4754	8.7607	-0.1452	-3.2308	-10.8825	0.4071	10.2847	24.9432	0.4183	8.3139
08/10/2010	3.9824	0.1696	4.3440	1.4602	0.2983	9.3510	-14.9013	-0.0449	-1.8319	19.9924	0.7341	16.9523
09/10/2010	-1.8495	-0.2193	-5.6261	-9.4325	0.0365	-0.1744	-8.1291	-0.4634	-12.6289	12.1920	0.9427	23.1561
10/10/2010	-0.5109	0.2274	5.8569	2.1438	-0.3035	-9.0594	4.5376	-0.5455	-14.2987	2.6499	1.0147	26.0209
11/10/2010	2.8466	-0.2017	-5.2010	8.4452	0.0955	4.1226	13.9003	-0.2331	-5.6190	-7.2713	0.9401	25.1226
12/10/2010	-4.6722	0.1382	3.5754	-5.5963	0.2707	7.6468	13.1422	0.2452	7.1385	-16.1516	0.7303	20.5930
13/10/2010	5.7335	-0.0571	-1.4802	-6.3898	-0.1913	-6.8438	2.8239	0.5415	14.6873	-22.7208	0.4163	13.0945
14/10/2010	-5.8150	-0.0392	-1.0210	8.0902	-0.1845	-4.6527	-9.5485	0.4428	11.5285	-26.0509	0.0437	3.7194
15/10/2010	4.9680	0.1217	3.1796	2.9868	0.2722	8.9753	-15.0071	0.0235	-0.0136	-25.6815	-0.3341	-6.1855
16/10/2010	-3.2245	-0.1898	-4.9656	-9.3349	0.0854	1.3975	-9.6043	-0.4116	-11.5528	-21.6838	-0.6636	-15.2204
17/10/2010	1.0177	0.2205	5.7923	0.5796	-0.2965	-9.2933	2.7557	-0.5481	-14.7504	-14.6350	-0.8990	-22.1259
18/10/2010	1.4221	-0.2188	-5.7549	9.0113	0.0438	2.6449	13.1098	-0.2884	-7.2875	-5.5362	-1.0082	-25.9556
19/10/2010	-3.5871	0.1765	4.6598	-4.2461	0.2841	8.4733	13.9283	0.1773	5.4573	4.3340	-0.9769	-26.1900
20/10/2010	5.1654	-0.1097	-2.9022	-7.4595	-0.1449	-5.6729	4.6183	0.5103	14.2205	13.5981	-0.8104	-22.8035
21/10/2010	-5.8763	0.0194	0.5132	7.1788	-0.2169	-5.9561	-8.0483	0.4705	12.6156	20.9609	-0.5327	-16.2581
22/10/2010	5.6262	0.0671	1.7898									

	I:x	I:y	I:z	II:x	II:y	II:z	III:x	III:y	III:z	IV:x	IV:y	IV:z
24/11/2010	-1.6292	-0.1967	-5.7004	-9.1451	0.1008	2.1894	12.3498	0.2602	8.4255	24.3361	-0.2683	-10.4671
25/11/2010	-0.7783	0.2006	5.8284	-0.1587	-0.2591	-9.3098	1.3591	0.4900	14.8973	26.3868	0.0717	-0.8583
26/11/2010	3.0182	-0.1754	-5.0975	9.2448	0.0107	1.8323	-10.6188	0.3646	10.5618	24.7611	0.3997	8.8654
27/11/2010	-4.8168	0.1168	3.3981	-3.4006	0.2599	8.8350	-14.9511	-0.0235	-1.4082	19.6691	0.6698	17.3415
28/11/2010	5.7638	-0.0447	-1.2963	-7.9113	-0.1033	-4.9722	-8.5256	-0.3946	-12.3713	11.8137	0.8440	23.3620
29/11/2010	-5.7958	-0.0406	-1.1965	6.6283	-0.2117	-6.5991	4.0379	-0.4816	-14.4499	2.2918	0.8980	26.0604
30/11/2010	4.8603	0.1131	3.3209	5.3036	0.1933	7.8493	13.6784	-0.2222	-6.1297	-7.5524	0.8242	25.0433
01/12/2010	-3.1234	-0.1717	-5.0396	-8.5890	0.1437	3.8423	13.4114	0.1959	6.6137	-16.3288	0.6334	20.4550
02/12/2010	0.8608	0.1978	5.8160	-1.8968	-0.2428	-9.1162	3.4341	0.4701	14.5569	-22.7980	0.3532	12.9603
03/12/2010	1.5062	-0.1950	-5.7308	9.4187	-0.0392	0.0888	-9.0284	0.4035	11.9446	-26.0586	0.0235	3.6333
04/12/2010	-3.6880	0.1561	4.5927	-1.7123	0.2630	9.3148	-14.9941	0.0459	0.7001	-25.6698	-0.3092	-6.2026
05/12/2010	5.1877	-0.0965	-2.8362	-8.7075	-0.0547	-3.4055	-10.1804	-0.3448	-11.0550	-21.7041	-0.5987	-15.1777
06/12/2010	-5.8960	0.0155	0.4465	5.2670	-0.2350	-7.7203	1.9533	-0.4879	-14.8801	-14.7312	-0.8052	-22.0586
07/12/2010	5.5955	0.0619	1.8424	6.6678	0.1540	6.7244	12.6726	-0.2804	-8.0163	-5.7261	-0.9008	-25.9159
08/12/2010	-4.3914	-0.1343	-3.9831	-7.7221	0.1817	5.3867	14.2250	0.1280	4.6240	4.0635	-0.8731	-26.2372
09/12/2010	2.4488	0.1802	5.3451	-3.5924	-0.2186	-8.5923	5.4849	0.4420	13.9091	13.2938	-0.7264	-22.9838
10/12/2010	-0.1389	-0.2000	-5.9253	9.2616	-0.0876	-1.6829	-7.2214	0.4356	13.1104	20.6955	-0.4810	-16.5960
11/12/2010	-2.2577	0.1833	5.4363	0.0629	0.2577	9.4739	-14.7327	0.1147	2.8358	25.2457	-0.1707	-7.9354
12/12/2010	4.1970	-0.1408	-4.1692	-9.2007	-0.0044	-1.6910	-11.6602	-0.2890	-9.4855	26.3067	0.1619	1.8153
13/12/2010	-5.5327	0.0701	2.0697	3.6954	-0.2505	-8.5765	-0.2136	-0.4858	-15.0098	23.7150	0.4707	11.3118
14/12/2010	5.8925	0.0063	0.2020	7.8141	0.1097	5.3437	11.3814	-0.3338	-9.7674	17.8156	0.7127	19.2228
15/12/2010	-5.3251	-0.0870	-2.6028	-6.5627	0.2138	6.7604	14.7509	0.0578	2.5049	9.4181	0.8539	24.4224
16/12/2010	3.8554	0.1487	4.4401	-5.1792	-0.1870	-7.7430	7.4526	0.4062	12.9578	-0.3018	0.8741	26.1619
17/12/2010	-1.7889	-0.1898	-5.6524	8.7644	-0.1333	-3.4165	-5.2328	0.4602	14.0204	-9.9784	0.7707	24.1875
18/12/2010	-0.6330	0.1963	5.8494	1.8611	0.2438	9.2918	-14.1571	0.1821	4.9521	-18.2493	0.5584	18.7849
19/12/2010	2.8603	-0.1743	-5.1815	-9.3590	0.0465	0.1113	-12.9231	-0.2276	-7.6827	-23.9564	0.2673	10.7282
20/12/2010	-4.7215	0.1192	3.5404	1.9646	-0.2575	-9.1234	-2.4224	-0.4749	-14.8197	-26.3120	-0.0616	1.1673
21/12/2010	5.7148	-0.0500	-1.4704	8.6892	0.0613	3.7487	9.8140	-0.3819	-11.3417	-25.0055	-0.3821	-8.5557
22/12/2010	-5.8387	-0.0330	-1.0016	-5.1439	0.2390	7.9022	14.9621	-0.0145	0.2910	-20.2408	-0.6503	-17.0974
23/12/2010	4.9594	0.1055	3.1637	-6.5895	-0.1485	-6.5887	9.2908	0.3624	11.7057	-12.6892	-0.8295	-23.2973
24/12/2010	-3.3089	-0.1648	-4.9214	7.9317	-0.1750	-5.0433	-3.0959	0.4767	14.6390	-3.3993	-0.8956	-26.3246
25/12/2010	1.0568	0.1939	5.7857	3.6143	0.2215	8.7615	-13.2609	0.2469	6.9962	6.3547	-0.8398	-25.7780
26/12/2010	1.2786	-0.1943	-5.7812	-9.1627	0.0964	1.9334	-13.9189	-0.1611	-5.6809	15.2391	-0.6702	-21.7366
27/12/2010	-3.5175	0.1592	4.7323	0.1384	-0.2555	-9.3264	-4.6071	-0.4549	-14.2964	22.0383	-0.4095	-14.7395
28/12/2010	5.0649	-0.1026	-3.0363	9.2476	0.0100	1.9935	8.0064	-0.4233	-12.6826	25.8137	-0.0933	-5.7301
29/12/2010	-5.8786	0.0241	0.6939	-3.5108	0.2563	8.7584	14.8409	-0.0875	-1.9592	26.0301	0.2351	4.0657
30/12/2010	5.6605	0.0535	1.6138	-7.7601	-0.1039	-5.1640	10.9489	0.3109	10.1717	22.6427	0.5304	13.2944
31/12/2010	-4.5695	-0.1266	-3.7814	6.7845	-0.2111	-6.4933	-0.8532	0.4842	14.9382	16.1036	0.7514	20.6634
01/01/2011	2.6712	0.1758	5.2384	5.2507	0.1907	7.8911	-12.0484	0.3084	8.9192	7.3146	0.8668	25.1263

Distanze in raggi di Giove dei satelliti : Io (I), Europa (II), Ganimede (III), Callisto (IV), alle ore 0 in T.U.

Distance in Jupiter's radii : Io (I), Europa (II), Ganimede (III), Callisto (IV), at 00.00 U.T.



# FENOMENI MUTUI DEI SATELLITI DI GIOVE

## MUTUAL PHENOMENA OF THE MOONS OF JUPITER

Ec.D. : inizio dell'eclisse  
 Ec.R. : fine dell'eclisse  
 Oc.D. : inizio dell'occultazione  
 Oc.R. : fine dell'occultazione  
 Tr.I. : inizio del transito  
 Tr.E. : fine del transito  
 Sh.I. : ingresso dell'ombra  
 Sh.E. : uscita dell'ombra

I : Io  
 II : Europa  
 III: Ganymede  
 IV : Callisto

TEMPI IN T.U.

Ec.D. : beginning of the eclipse  
 Ec.R. : ending of the eclipse  
 Oc.D. : beginning of the occultation  
 Oc.R. : ending of the occultation  
 Tr.I. : beginning of the transit  
 Tr.E. : ending of the transit  
 Sh.I. : beginning of the umbra transit  
 Sh.E. : ending of the umbra transit

I : Io  
 II : Europa  
 III: Ganymede  
 IV : Callisto

TIMES IN U.T.

Date	Time	M	Phe	Pha	h	h S
01/01/2010	11.54.42	I	Occ.	D.	24.7	24.4
01/01/2010	15.09.35	I	Ec.	R.	33.5	5.7
01/01/2010	23.19.29	II	Tr.	I.	-41.4	-70.9
02/01/2010	1.13.56	II	Sh.	I.	-57.9	-58.9
02/01/2010	2.13.36	II	Tr.	E.	-61.5	-48.6
02/01/2010	4.07.34	II	Sh.	E.	-53.5	-27.5
02/01/2010	9.16.36	I	Tr.	I.	1.3	19.5
02/01/2010	10.13.02	I	Sh.	I.	10.6	23.5
02/01/2010	11.34.19	I	Tr.	E.	22.6	25.0
02/01/2010	12.30.07	I	Sh.	E.	29.0	22.9
02/01/2010	23.26.19	III	Tr.	I.	-43.0	-70.7
03/01/2010	3.05.09	III	Tr.	E.	-59.8	-39.1
03/01/2010	3.15.04	III	Sh.	I.	-59.0	-37.3
03/01/2010	6.25.02	I	Occ.	D.	-29.9	-2.9
03/01/2010	6.49.05	III	Sh.	E.	-25.5	1.0
03/01/2010	9.38.30	I	Ec.	R.	5.5	21.4
03/01/2010	18.31.09	II	Occ.	D.	9.7	-28.6
03/01/2010	23.14.11	II	Ec.	R.	-41.5	-70.8
04/01/2010	3.46.54	I	Tr.	I.	-55.2	-31.4
04/01/2010	4.41.52	I	Sh.	I.	-47.3	-21.3
04/01/2010	6.04.36	I	Tr.	E.	-33.1	-6.8
04/01/2010	6.58.56	I	Sh.	E.	-23.0	2.4
05/01/2010	0.55.20	I	Occ.	D.	-56.8	-61.8
05/01/2010	4.07.20	I	Ec.	R.	-52.0	-27.6
05/01/2010	12.43.51	II	Tr.	I.	31.2	22.4
05/01/2010	14.32.29	II	Sh.	I.	34.5	11.4
05/01/2010	15.38.02	II	Tr.	E.	31.2	2.1
05/01/2010	17.26.07	II	Sh.	E.	18.8	-16.5
05/01/2010	22.17.10	I	Tr.	I.	-32.3	-66.8
05/01/2010	23.10.39	I	Sh.	I.	-41.8	-70.5
06/01/2010	0.34.51	I	Tr.	E.	-54.7	-64.7
06/01/2010	1.27.42	I	Sh.	E.	-59.9	-56.6
06/01/2010	11.10.38	IV	Tr.	I.	21.4	25.5
06/01/2010	13.31.03	III	Occ.	D.	34.2	18.6
06/01/2010	15.52.10	IV	Tr.	E.	29.8	0.3
06/01/2010	19.25.42	I	Occ.	D.	-0.6	-38.2
06/01/2010	19.49.58	IV	Sh.	I.	-5.7	-42.7
06/01/2010	20.40.03	III	Ec.	R.	-14.9	-51.8
06/01/2010	22.36.14	I	Ec.	R.	-36.3	-68.6
07/01/2010	0.06.01	IV	Sh.	E.	-56.1	-68.0
07/01/2010	7.55.26	II	Occ.	D.	-10.7	10.5
07/01/2010	12.32.20	II	Ec.	R.	30.9	23.5
07/01/2010	16.47.33	I	Tr.	I.	23.4	-9.4
07/01/2010	17.39.31	I	Sh.	I.	16.1	-18.6
07/01/2010	19.05.12	I	Tr.	E.	2.1	-34.3
07/01/2010	19.56.32	I	Sh.	E.	-7.4	-43.8
08/01/2010	13.56.02	I	Occ.	D.	34.9	16.3
08/01/2010	17.05.03	I	Ec.	R.	20.7	-12.3
09/01/2010	2.08.53	II	Tr.	I.	-61.0	-49.5
09/01/2010	3.51.31	II	Sh.	I.	-52.3	-30.6
09/01/2010	5.03.12	II	Tr.	E.	-40.9	-17.5
09/01/2010	6.45.14	II	Sh.	E.	-22.5	0.5
09/01/2010	11.17.52	I	Tr.	I.	23.7	26.0
09/01/2010	12.08.17	I	Sh.	I.	29.4	25.0
09/01/2010	13.35.29	I	Tr.	E.	34.8	18.7
09/01/2010	14.25.17	I	Sh.	E.	34.7	12.9
10/01/2010	3.52.55	III	Tr.	I.	-51.6	-30.3
10/01/2010	7.16.57	III	Sh.	I.	-15.9	5.2
10/01/2010	7.31.26	III	Tr.	E.	-13.3	7.3
10/01/2010	8.26.29	I	Occ.	D.	-2.6	14.7
10/01/2010	10.50.29	III	Sh.	E.	20.6	25.7
10/01/2010	11.33.58	I	Ec.	R.	26.2	26.0
10/01/2010	21.20.01	II	Occ.	D.	-24.5	-57.9
11/01/2010	1.50.30	II	Ec.	R.	-60.9	-52.7
11/01/2010	5.48.15	I	Tr.	I.	-31.7	-9.5
11/01/2010	6.37.06	I	Sh.	I.	-22.7	-0.5
11/01/2010	8.05.50	I	Tr.	E.	-6.3	12.1
11/01/2010	8.54.04	I	Sh.	E.	2.7	17.9
12/01/2010	2.56.53	I	Occ.	D.	-57.5	-40.7

Date	Time	M	Phe	Pha	h	h S
12/01/2010	6.02.48	I	Ec.	R.	-28.4	-6.9
12/01/2010	15.33.44	II	Tr.	I.	30.2	3.9
12/01/2010	17.10.05	II	Sh.	I.	18.4	-12.5
12/01/2010	18.10.07	II	Tr.	E.	6.0	-26.6
12/01/2010	20.03.47	II	Sh.	E.	-11.4	-44.3
13/01/2010	0.18.36	I	Tr.	I.	-54.9	-66.2
13/01/2010	1.05.52	I	Sh.	I.	-59.4	-59.9
13/01/2010	2.36.10	I	Tr.	E.	-58.9	-44.4
13/01/2010	3.22.48	I	Sh.	E.	-54.2	-35.8
13/01/2010	17.57.53	III	Occ.	D.	10.5	-20.9
13/01/2010	21.27.22	I	Occ.	D.	-27.4	-58.5
14/01/2010	0.31.41	I	Ec.	R.	-56.6	-64.6
14/01/2010	0.41.03	III	Ec.	R.	-57.6	-63.4
14/01/2010	10.44.36	II	Occ.	D.	21.7	26.2
14/01/2010	15.08.32	II	Ec.	R.	32.0	7.9
14/01/2010	18.49.03	I	Tr.	I.	1.6	-30.1
14/01/2010	19.34.42	I	Sh.	I.	-7.1	-38.6
14/01/2010	21.06.35	I	Tr.	E.	-24.1	-55.0
14/01/2010	21.51.36	I	Sh.	E.	-32.3	-62.0
14/01/2010	22.29.47	IV	Occ.	D.	-39.1	-66.6
15/01/2010	3.06.53	IV	Occ.	R.	-55.2	-38.7
15/01/2010	5.45.46	IV	Ec.	D.	-29.7	-9.7
15/01/2010	9.57.56	IV	Ec.	R.	15.4	24.0
15/01/2010	15.57.47	I	Occ.	D.	26.9	0.8
15/01/2010	19.00.29	I	Ec.	R.	-0.6	-32.1
16/01/2010	4.59.20	II	Tr.	I.	-37.4	-17.9
16/01/2010	6.29.14	II	Sh.	I.	-21.0	-1.4
16/01/2010	7.53.49	II	Tr.	E.	-5.4	10.9
16/01/2010	9.23.00	II	Sh.	E.	10.3	21.4
16/01/2010	13.19.26	I	Tr.	I.	35.4	21.5
16/01/2010	14.03.27	I	Sh.	I.	35.2	16.9
16/01/2010	15.36.57	I	Tr.	E.	29.0	4.1
16/01/2010	16.20.20	I	Sh.	E.	23.9	-2.6
17/01/2010	8.21.43	III	Tr.	I.	0.7	14.8
17/01/2010	10.28.20	I	Occ.	D.	20.9	26.1
17/01/2010	11.19.11	III	Sh.	I.	27.4	27.3
17/01/2010	11.59.46	III	Tr.	E.	31.5	26.7
17/01/2010	13.29.23	I	Ec.	R.	35.6	20.8
17/01/2010	14.52.10	III	Sh.	E.	32.7	10.9
18/01/2010	0.09.25	II	Occ.	D.	-55.3	-66.4
18/01/2010	4.26.35	II	Ec.	R.	-41.9	-23.8
18/01/2010	7.49.53	I	Tr.	I.	-4.8	10.6
18/01/2010	8.32.14	I	Sh.	I.	3.0	16.2
18/01/2010	10.07.22	I	Tr.	E.	18.4	25.2
18/01/2010	10.49.06	I	Sh.	E.	24.2	27.0
19/01/2010	4.58.49	I	Occ.	D.	-35.7	-17.8
19/01/2010	7.58.12	I	Ec.	R.	-2.1	11.9
19/01/2010	18.24.37	II	Tr.	I.	3.3	-24.7
19/01/2010	19.47.49	II	Sh.	I.	-12.1	-40.1
19/01/2010	21.19.09	II	Tr.	E.	-29.0	-56.0
19/01/2010	22.41.35	II	Sh.	E.	-43.5	-66.5
20/01/2010	2.20.18	I	Tr.	I.	-57.9	-46.9
20/01/2010	3.00.59	I	Sh.	I.	-53.7	-39.5
20/01/2010	4.37.46	I	Tr.	E.	-38.8	-21.6
20/01/2010	5.17.49	I	Sh.	E.	-31.7	-14.3
20/01/2010	22.26.26	III	Occ.	D.	-41.4	-64.9
20/01/2010	23.29.22	I	Occ.	D.	-51.2	-67.9
21/01/2010	2.27.05	I	Ec.	R.	-57.0	-45.6
21/01/2010	4.42.07	III	Ec.	R.	-37.5	-20.7
21/01/2010	13.34.15	II	Occ.	D.	35.9	21.2
21/01/2010	17.44.32	II	Ec.	R.	9.1	-17.0
21/01/2010	20.50.48	I	Tr.	I.	-24.8	-50.9
21/01/2010	21.29.47	I	Sh.	I.	-31.9	-57.3
21/01/2010	23.08.14	I	Tr.	E.	-48.5	-67.5
21/01/2010	23.46.35	I	Sh.	E.	-53.8	-67.2
22/01/2010	17.59.52	I	Occ.	D.	6.1	-19.6
22/01/2010	20.55.52	I	Ec.	R.	-26.2	-51.6
23/01/2010	7.50.38	II	Tr.	I.	-0.9	11.4
23/01/2010	7.56.35	IV	Tr.	I.	0.0	12.2

Date	Time	M	Phe	Pha	h	h S
23/01/2010	9.07.00	II	Sh.	I.	11.7	21.0
23/01/2010	10.45.15	II	Tr.	E.	26.0	28.0
23/01/2010	12.00.49	II	Sh.	E.	33.5	28.0
23/01/2010	12.32.24	IV	Tr.	E.	35.2	26.6
23/01/2010	14.08.11	IV	Sh.	I.	34.8	17.9
23/01/2010	15.21.15	I	Tr.	I.	28.8	7.9
23/01/2010	15.58.30	I	Sh.	I.	24.4	2.2
23/01/2010	17.38.39	I	Tr.	E.	9.2	-15.5
23/01/2010	18.15.18	I	Sh.	E.	3.0	-22.2
23/01/2010	18.18.04	IV	Sh.	E.	2.6	-22.7
24/01/2010	12.30.29	I	Occ.	D.	35.3	27.0
24/01/2010	12.51.06	III	Tr.	I.	36.0	25.7
24/01/2010	15.20.35	III	Sh.	I.	28.6	8.2
24/01/2010	15.24.46	I	Ec.	R.	28.2	7.6
24/01/2010	16.28.37	III	Tr.	E.	19.8	-2.3
24/01/2010	18.53.01	III	Sh.	E.	-4.4	-29.0
25/01/2010	2.59.16	II	Occ.	D.	-51.6	-39.3
25/01/2010	7.02.29	II	Ec.	R.	-9.3	4.5
25/01/2010	9.51.44	I	Tr.	I.	19.7	25.5
25/01/2010	10.27.16	I	Sh.	I.	24.6	27.7
25/01/2010	12.09.07	I	Tr.	E.	34.5	28.2
25/01/2010	12.44.02	I	Sh.	E.	36.0	26.4
26/01/2010	7.01.02	I	Occ.	D.	-8.9	4.4
26/01/2010	9.53.34	I	Ec.	R.	20.5	25.8
26/01/2010	21.16.16	II	Tr.	I.	-32.0	-54.1
26/01/2010	22.25.36	II	Sh.	I.	-43.9	-63.4
27/01/2010	0.10.55	II	Tr.	E.	-57.4	-64.6
27/01/2010	1.19.24	II	Sh.	E.	-59.5	-56.2
27/01/2010	4.22.12	I	Tr.	I.	-37.4	-23.7
27/01/2010	4.55.59	I	Sh.	I.	-31.4	-17.5
27/01/2010	6.39.33	I	Tr.	E.	-12.3	1.2
27/01/2010	7.12.43	I	Sh.	E.	-6.2	6.3
28/01/2010	1.31.40	I	Occ.	D.	-58.8	-54.1
28/01/2010	2.57.05	III	Occ.	D.	-50.4	-39.3
28/01/2010	4.22.26	I	Ec.	R.	-36.8	-23.6
28/01/2010	8.43.56	III	Ec.	R.	10.7	19.3
28/01/2010	16.24.17	II	Occ.	D.	18.9	-0.6
28/01/2010	20.20.22	II	Ec.	R.	-22.7	-44.2
28/01/2010	22.52.45	I	Tr.	I.	-48.9	-65.1
28/01/2010	23.24.45	I	Sh.	I.	-53.2	-66.0
29/01/2010	1.10.03	I	Tr.	E.	-59.4	-57.2
29/01/2010	1.41.28	I	Sh.	E.	-58.0	-52.4
29/01/2010	20.02.13	I	Occ.	D.	-19.9	-40.7
29/01/2010	22.51.12	I	Ec.	R.	-49.1	-64.7
30/01/2010	10.42.39	II	Tr.	I.	28.7	29.6
30/01/2010	11.44.51	II	Sh.	I.	34.4	30.2
30/01/2010	13.37.22	II	Tr.	E.	35.8	23.8
30/01/2010	14.38.41	II	Sh.	E.	31.5	15.7
30/01/2010	17.23.14	I	Tr.	I.	8.6	11.3
30/01/2010	17.53.27	I	Sh.	I.	3.5	-16.8
30/01/2010	19.40.31	I	Tr.	E.	-16.4	-36.6
30/01/2010	20.10.09	I	Sh.	E.	-21.9	-41.9
31/01/2010	14.32.54	I	Occ.	D.	31.8	16.7
31/01/2010	17.20.05	I	Ec.	R.	8.7	-10.6
31/01/2010	17.21.22	III	Tr.	I.	8.5	-10.8
31/01/2010	19.18.28	IV	Occ.	D.	-12.8	-32.3
31/01/2010	19.21.43	III	Sh.	I.	-13.4	-32.9
31/01/2010	20.58.14	III	Tr.	E.	-31.2	-50.0
31/01/2010	22.53.35	III	Sh.	E.	-50.2	-64.3
31/01/2010	23.48.53	IV	Occ.	R.	-56.5	-64.7
01/02/2010	0.01.09	IV	Ec.	D.	-57.5	-64.1
01/02/2010	4.07.16	IV	Ec.	R.	-37.1	-25.8
01/02/2010	5.49.23	II	Occ.	D.	-18.5	-7.2
01/02/2010	9.38.11	II	Ec.	R.	21.3	26.0
01/02/2010	11.53.45	I	Tr.	I.	35.4	30.6
01/02/2010	12.22.11	I	Sh.	I.	36.5	29.6
01/02/2010	14.11.00	I	Tr.	E.	33.5	19.8
01/02/2010	14.38.51	I	Sh.	E.	31.1	16.1
02/02/2010	9.03.30	I	Occ.	D.	16.6	22.2

Date	Time	M	Phe	Pha	h	h S
02/02/2010	11.48.53	I	Ec.	R.	35.4	31.0
03/02/2010	0.08.36	II	Tr.	I.	-58.1	-63.0
03/02/2010	1.03.29	II	Sh.	I.	-58.7	-57.1
03/02/2010	3.03.20	II	Tr.	E.	-46.5	-37.3
03/02/2010	3.57.18	II	Sh.	E.	-37.6	-27.4
03/02/2010	6.24.14	I	Tr.	I.	-10.8	0.0
03/02/2010	6.50.52	I	Sh.	I.	-5.8	4.1
03/02/2010	8.41.28	I	Tr.	E.	13.7	20.3
03/02/2010	9.07.31	I	Sh.	E.	17.8	23.4
04/02/2010	3.34.10	I	Occ.	D.	-41.0	-31.5
04/02/2010	6.17.44	I	Ec.	R.	-11.4	-0.8
04/02/2010	7.28.20	III	Occ.	D.	1.9	10.2
04/02/2010	12.45.12	III	Ec.	R.	37.1	29.1
04/02/2010	19.14.31	II	Occ.	D.	-14.1	-30.8
04/02/2010	22.55.59	II	Ec.	R.	-51.8	-63.3
05/02/2010	0.54.48	I	Tr.	I.	-58.6	-57.8
05/02/2010	1.19.37	I	Sh.	I.	-57.5	-54.4
05/02/2010	3.11.59	I	Tr.	E.	-44.0	-35.4
05/02/2010	3.36.14	I	Sh.	E.	-40.1	-30.9
05/02/2010	22.04.46	I	Occ.	D.	-44.8	-58.5
06/02/2010	0.46.29	I	Ec.	R.	-58.7	-58.5
06/02/2010	13.35.17	II	Tr.	I.	35.4	25.2
06/02/2010	14.22.46	II	Sh.	I.	31.5	19.6
06/02/2010	16.30.05	II	Tr.	E.	14.3	0.2
06/02/2010	17.16.37	II	Sh.	E.	6.5	-8.7
06/02/2010	19.25.19	I	Tr.	I.	-17.1	-32.3
06/02/2010	19.48.18	I	Sh.	I.	-21.4	-36.5
06/02/2010	21.42.28	I	Tr.	E.	-41.7	-55.3
06/02/2010	22.04.54	I	Sh.	E.	-45.3	-58.2
07/02/2010	16.35.29	I	Occ.	D.	13.0	-0.4
07/02/2010	19.15.21	I	Ec.	R.	-15.8	-30.3
07/02/2010	21.52.31	III	Tr.	I.	-43.7	-56.4
07/02/2010	23.22.50	III	Sh.	I.	-55.5	-63.1
08/02/2010	1.28.41	III	Tr.	E.	-55.9	-52.3
08/02/2010	2.54.09	III	Sh.	E.	-45.2	-38.0
08/02/2010	8.39.43	II	Occ.	D.	16.1	21.4
08/02/2010	12.13.42	II	Ec.	R.	37.4	32.0
08/02/2010	13.55.51	I	Tr.	I.	33.6	23.5
08/02/2010	14.17.00	I	Sh.	I.	31.7	20.9
08/02/2010	16.12.59	I	Tr.	E.	16.2	3.3
08/02/2010	16.33.34	I	Sh.	E.	12.9	0.1
09/02/2010	4.59.47	IV	Tr.	I.	-22.7	-14.7
09/02/2010	8.26.52	IV	Sh.	I.	14.6	19.9
09/02/2010	9.27.28	IV	Tr.	E.	23.8	27.1
09/02/2010	11.06.07	I	Occ.	D.	34.6	33.2
09/02/2010	12.30.11	IV	Sh.	E.	37.5	31.5
09/02/2010	13.44.08	I	Ec.	R.	34.4	25.1
10/02/2010	3.01.26	II	Tr.	I.	-43.0	-36.3
10/02/2010	3.41.23	II	Sh.	I.	-36.3	-29.0
10/02/2010	5.56.12	II	Tr.	E.	-11.6	-4.0
10/02/2010	6.35.12	II	Sh.	E.	-4.3	3.0
10/02/2010	8.26.22	I	Tr.	I.	15.1	20.1
10/02/2010	8.45.40	I	Sh.	I.	18.2	22.7
10/02/2010	10.43.27	I	Tr.	E.	33.1	32.9
10/02/2010	11.02.13	I	Sh.	E.	34.6	33.4
11/02/2010	5.36.50	I	Occ.	D.	-14.6	-7.5
11/02/2010	8.12.59	I	Ec.	R.	13.5	18.6
11/02/2010	12.00.51	III	Occ.	D.	37.6	33.5
11/02/2010	16.46.47	III	Ec.	R.	9.3	-1.4
11/02/2010	22.04.57	II	Occ.	D.	-47.2	-56.8
12/02/2010	1.31.27	II	Ec.	R.	-54.2	-50.9
12/02/2010	2.56.56	I	Tr.	I.	-42.6	-36.7
12/02/2010	3.14.23	I	Sh.	I.	-39.7	-33.5
12/02/2010	5.13.59	I	Tr.	E.	-18.2	-11.5
12/02/2010	5.30.54	I	Sh.	E.	-15.1	-8.4
13/02/2010	0.07.27	I	Occ.	D.	-58.2	-60.1
13/02/2010	2.41.43	I	Ec.	R.	-44.4	-39.1
13/02/2010	16.28.22	II	Tr.	I.	11.5	1.9
13/02/2010	17.00.43	II	Sh.	I.	6.0	-4.0
13/02/2010	19.23.10	II	Tr.	E.	-20.3	-30.4
13/02/2010	19.54.33	II	Sh.	E.	-26.0	-36.1
13/02/2010	21.27.27	I	Tr.	I.	-42.2	-51.4
13/02/2010	21.43.02	I	Sh.	I.	-44.7	-53.5
13/02/2010	23.44.29	I	Tr.	E.	-57.6	-60.9
13/02/2010	23.59.33	I	Sh.	E.	-58.0	-60.2
14/02/2010	18.38.12	I	Occ.	D.	-12.4	-21.9
14/02/2010	21.10.34	I	Ec.	R.	-39.9	-48.6
15/02/2010	2.24.33	III	Tr.	I.	-46.0	-41.6
15/02/2010	3.24.06	III	Sh.	I.	-36.3	-31.1
15/02/2010	5.59.52	III	Tr.	E.	-7.9	-1.6
15/02/2010	6.54.50	III	Sh.	E.	2.5	7.4
15/02/2010	11.30.09	II	Occ.	D.	37.5	35.4
15/02/2010	14.49.05	II	Ec.	R.	25.9	18.3
15/02/2010	15.58.00	I	Tr.	I.	15.7	7.4
15/02/2010	16.11.42	I	Sh.	I.	13.4	5.1
15/02/2010	18.14.59	I	Tr.	E.	-8.6	-17.4
15/02/2010	18.28.11	I	Sh.	E.	-11.1	-19.9

Date	Time	M	Phe	Pha	h	h S
16/02/2010	13.08.51	I	Occ.	D.	36.0	30.9
16/02/2010	15.39.19	I	Ec.	R.	18.2	10.7
17/02/2010	5.54.40	II	Tr.	I.	-7.6	-2.2
17/02/2010	6.19.20	II	Sh.	I.	-2.4	1.9
17/02/2010	8.49.25	II	Tr.	E.	22.4	25.2
17/02/2010	9.13.08	II	Sh.	E.	25.8	28.0
17/02/2010	10.28.31	I	Tr.	I.	34.2	34.5
17/02/2010	10.40.21	I	Sh.	I.	35.2	35.1
17/02/2010	12.45.28	I	Tr.	E.	37.2	33.1
17/02/2010	12.56.48	I	Sh.	E.	36.6	32.2
17/02/2010	16.19.24	IV	Occ.	D.	11.3	4.3
17/02/2010	22.15.55	IV	Ec.	R.	-50.7	-56.1
18/02/2010	7.39.35	I	Occ.	D.	11.9	15.5
18/02/2010	10.08.09	I	Ec.	R.	32.7	33.5
18/02/2010	16.33.06	III	Occ.	D.	8.5	2.2
18/02/2010	20.47.30	III	Ec.	R.	-37.8	-44.0
19/02/2010	0.55.23	II	Occ.	D.	-55.0	-53.7
19/02/2010	4.06.43	II	Ec.	R.	-26.3	-22.3
19/02/2010	4.59.04	I	Tr.	I.	-16.7	-12.6
19/02/2010	5.09.02	I	Sh.	I.	-14.8	-10.7
19/02/2010	7.16.00	I	Tr.	E.	8.5	12.0
19/02/2010	7.25.28	I	Sh.	E.	10.1	13.5
20/02/2010	2.10.13	I	Occ.	D.	-45.5	-42.7
20/02/2010	4.36.52	I	Ec.	R.	-20.2	-16.4
20/02/2010	19.21.48	II	Tr.	I.	-23.5	-28.6
20/02/2010	19.38.44	II	Sh.	I.	-26.6	-31.7
20/02/2010	22.16.34	II	Tr.	E.	-51.7	-55.2
20/02/2010	22.32.33	II	Sh.	E.	-53.4	-56.6
20/02/2010	23.29.36	I	Tr.	I.	-57.2	-58.7
20/02/2010	23.37.40	I	Sh.	I.	-57.4	-58.6
21/02/2010	1.46.29	I	Tr.	E.	-48.4	-46.1
21/02/2010	1.54.05	I	Sh.	E.	-47.3	-44.9
21/02/2010	20.40.58	I	Occ.	D.	-38.1	-42.1
21/02/2010	23.05.42	I	Ec.	R.	-56.2	-58.0
22/02/2010	6.57.49	III	Tr.	I.	7.1	9.8
22/02/2010	7.26.07	III	Sh.	I.	11.9	14.5
22/02/2010	10.32.10	III	Tr.	E.	36.1	36.5
22/02/2010	10.56.17	III	Sh.	E.	37.5	37.4
22/02/2010	14.20.33	II	Occ.	D.	27.4	24.3
22/02/2010	17.24.15	II	Ec.	R.	-2.1	-6.5
22/02/2010	18.00.07	I	Tr.	I.	-9.4	-13.2
22/02/2010	18.06.18	I	Sh.	I.	-10.5	-14.3
22/02/2010	20.16.59	I	Tr.	E.	-34.4	-37.9
22/02/2010	20.22.42	I	Sh.	E.	-35.4	-38.9
23/02/2010	15.11.38	I	Occ.	D.	19.7	17.0
23/02/2010	17.34.26	I	Ec.	R.	-5.1	-8.2
24/02/2010	8.48.10	II	Tr.	I.	25.8	27.3
24/02/2010	8.57.19	II	Sh.	I.	27.0	28.4
24/02/2010	11.42.51	II	Tr.	E.	38.9	38.5
24/02/2010	11.51.05	II	Sh.	E.	38.8	38.3
24/02/2010	12.30.37	I	Tr.	I.	37.5	36.5
24/02/2010	12.34.55	I	Sh.	I.	37.2	36.2
24/02/2010	14.47.27	I	Tr.	E.	23.0	21.0
24/02/2010	14.51.18	I	Sh.	E.	22.4	20.4
25/02/2010	9.42.22	I	Occ.	D.	32.8	33.8
25/02/2010	12.03.15	I	Ec.	R.	38.6	38.3
25/02/2010	21.05.28	III	Occ.	D.	-43.7	-44.9
26/02/2010	0.48.01	III	Ec.	R.	-53.1	-52.1
26/02/2010	2.11.41	IV	Tr.	I.	-42.1	-40.6
26/02/2010	2.44.45	IV	Sh.	I.	-36.6	-35.1
26/02/2010	3.45.46	II	Occ.	D.	-25.8	-24.3
26/02/2010	6.28.10	IV	Tr.	E.	4.3	5.8
26/02/2010	6.40.53	IV	Sh.	E.	6.5	8.0
26/02/2010	6.41.50	II	Ec.	R.	6.7	8.2
26/02/2010	7.01.10	I	Tr.	I.	10.0	11.5
26/02/2010	7.03.35	I	Sh.	I.	10.4	11.9
26/02/2010	9.17.57	I	Tr.	E.	30.5	31.6
26/02/2010	9.19.55	I	Sh.	E.	30.7	31.8
27/02/2010	4.12.59	I	Occ.	D.	-20.2	-19.0
27/02/2010	6.31.57	I	Ec.	R.	5.5	6.7
27/02/2010	22.15.23	II	Tr.	I.	-53.2	-52.8
27/02/2010	22.16.43	II	Sh.	I.	-53.4	-53.0
28/02/2010	1.10.02	II	Tr.	E.	-49.9	-48.9
28/02/2010	1.10.29	II	Sh.	E.	-49.8	-48.8
28/02/2010	1.31.40	I	Tr.	I.	-47.0	-46.0
28/02/2010	1.32.12	I	Sh.	I.	-46.9	-46.0
28/02/2010	3.48.26	I	Tr.	E.	-24.1	-23.2
28/02/2010	3.48.31	I	Sh.	E.	-24.1	-23.2
28/02/2010	22.43.18	I	Ec.	D.	-55.5	-54.6
01/03/2010	1.01.37	I	Occ.	R.	-50.4	-49.6
01/03/2010	11.27.27	III	Sh.	I.	39.3	40.5
01/03/2010	11.30.36	III	Tr.	I.	39.3	40.5
01/03/2010	14.56.58	III	Sh.	E.	19.6	20.8
01/03/2010	15.03.51	III	Tr.	E.	18.5	19.7
01/03/2010	17.08.24	II	Ec.	D.	-2.8	-1.3
01/03/2010	20.00.49	I	Sh.	I.	-34.8	-33.5
01/03/2010	20.02.11	I	Tr.	I.	-35.1	-33.7

Date	Time	M	Phe	Pha	h	h S
01/03/2010	20.02.39	II	Occ.	R.	-35.1	-33.8
01/03/2010	22.17.07	I	Sh.	E.	-53.8	-52.3
01/03/2010	22.18.54	I	Tr.	E.	-53.9	-52.5
02/03/2010	17.12.02	I	Ec.	D.	-4.3	-1.8
02/03/2010	19.32.15	I	Occ.	R.	-30.3	-28.3
03/03/2010	11.35.17	II	Sh.	I.	39.3	41.2
03/03/2010	11.41.45	II	Tr.	I.	39.2	41.1
03/03/2010	14.29.00	II	Sh.	E.	23.1	25.6</

Date	Time	M	Phe	Pha	h	h S
15/03/2010	23.49.31	I	Sh.	I.	-52.0	-49.4
16/03/2010	0.05.54	I	Tr.	I.	-50.4	-48.6
16/03/2010	0.06.16	III	Tr.	E.	-50.3	-48.6
16/03/2010	1.42.05	II	Occ.	R.	-36.8	-38.9
16/03/2010	2.05.40	I	Sh.	E.	-32.8	-35.5
16/03/2010	2.22.20	I	Tr.	E.	-29.9	-32.9
16/03/2010	21.02.00	I	Ec.	D.	-49.6	-39.0
16/03/2010	23.37.14	I	Occ.	R.	-52.7	-49.3
17/03/2010	16.51.16	II	Sh.	I.	-8.2	4.8
17/03/2010	17.28.49	II	Tr.	I.	-15.2	-1.7
17/03/2010	18.18.04	I	Sh.	I.	-24.2	-11.5
17/03/2010	18.36.18	I	Tr.	I.	-27.5	-14.9
17/03/2010	19.44.47	II	Sh.	E.	-39.2	-26.9
17/03/2010	20.22.56	II	Tr.	E.	-44.9	-33.0
17/03/2010	20.34.12	I	Sh.	E.	-46.4	-34.7
17/03/2010	20.52.42	I	Tr.	E.	-48.8	-37.4
18/03/2010	15.30.47	I	Ec.	D.	6.3	19.4
18/03/2010	18.07.51	I	Occ.	R.	-22.8	-9.5
19/03/2010	9.22.26	III	Ec.	D.	38.7	39.9
19/03/2010	11.35.55	II	Ec.	D.	38.6	47.4
19/03/2010	12.46.38	I	Sh.	I.	31.6	43.2
19/03/2010	13.06.43	I	Tr.	I.	29.1	41.2
19/03/2010	14.13.42	III	Occ.	R.	19.0	32.3
19/03/2010	15.02.45	I	Sh.	E.	10.7	24.4
19/03/2010	15.06.45	II	Occ.	R.	10.0	23.8
19/03/2010	15.23.04	I	Tr.	E.	7.2	21.0
20/03/2010	9.59.26	I	Ec.	D.	40.7	44.2
20/03/2010	12.38.21	I	Occ.	R.	32.4	44.3
21/03/2010	6.10.41	II	Sh.	I.	14.8	9.7
21/03/2010	6.55.53	II	Tr.	I.	22.2	17.9
21/03/2010	7.15.11	I	Sh.	I.	25.2	21.3
21/03/2010	7.37.07	I	Tr.	I.	28.3	25.1
21/03/2010	9.04.08	II	Sh.	E.	38.0	38.4
21/03/2010	9.31.17	I	Sh.	E.	39.8	41.7
21/03/2010	9.49.50	II	Tr.	E.	40.6	43.7
21/03/2010	9.53.26	I	Tr.	E.	40.7	44.0
22/03/2010	4.28.12	I	Ec.	D.	-2.5	-9.1
22/03/2010	7.08.56	I	Occ.	R.	24.8	20.5
22/03/2010	23.30.28	III	Sh.	I.	-51.2	-47.0
23/03/2010	0.53.19	II	Ec.	D.	-40.7	-42.1
23/03/2010	1.07.05	III	Tr.	I.	-38.5	-40.6
23/03/2010	1.43.44	I	Sh.	I.	-32.5	-36.1
23/03/2010	2.07.28	I	Tr.	I.	-28.3	-32.7
23/03/2010	2.57.54	III	Sh.	E.	-19.2	-24.7
23/03/2010	3.59.48	I	Sh.	E.	-7.7	-13.9
23/03/2010	4.23.45	I	Tr.	E.	-2.7	-9.6
23/03/2010	4.31.18	II	Occ.	R.	-1.1	-8.2
23/03/2010	4.36.04	III	Tr.	E.	-0.3	-7.3
23/03/2010	6.47.13	IV	Ec.	D.	21.9	17.0
23/03/2010	14.24.14	IV	Occ.	R.	15.5	31.7
23/03/2010	22.56.53	I	Ec.	D.	-53.4	-46.5
24/03/2010	1.39.26	I	Occ.	R.	-32.6	-36.3
24/03/2010	19.29.13	II	Sh.	I.	-39.6	-22.6
24/03/2010	20.12.15	I	Sh.	I.	-45.8	-29.5
24/03/2010	20.21.59	II	Tr.	I.	-47.1	-31.0
24/03/2010	20.37.49	I	Tr.	I.	-48.9	-33.3
24/03/2010	22.22.37	II	Sh.	E.	-54.5	-44.6
24/03/2010	22.28.19	I	Sh.	E.	-54.4	-44.9
24/03/2010	22.54.04	I	Tr.	E.	-53.3	-46.0
24/03/2010	23.15.47	II	Tr.	E.	-51.8	-46.3
25/03/2010	17.25.38	I	Ec.	D.	-18.6	0.4
25/03/2010	20.10.00	I	Occ.	R.	-45.9	-28.9
26/03/2010	13.23.51	III	Ec.	D.	24.0	41.3
26/03/2010	14.10.43	II	Ec.	D.	16.4	34.6
26/03/2010	14.40.48	I	Sh.	I.	11.3	29.8
26/03/2010	15.08.10	I	Tr.	I.	6.5	25.2
26/03/2010	16.56.51	I	Sh.	E.	-13.8	5.6
26/03/2010	17.24.22	I	Tr.	E.	-18.9	0.8
26/03/2010	17.55.44	II	Occ.	R.	-24.6	-5.5
26/03/2010	18.43.58	III	Occ.	R.	-33.1	-14.3
27/03/2010	11.54.17	I	Ec.	D.	35.5	49.8
27/03/2010	14.40.25	I	Occ.	R.	10.9	30.1
28/03/2010	8.48.37	II	Sh.	I.	39.0	38.8
28/03/2010	9.09.21	I	Sh.	I.	40.4	41.7
28/03/2010	9.38.30	I	Tr.	I.	41.5	45.2
28/03/2010	9.48.51	II	Tr.	I.	41.7	46.3
28/03/2010	11.25.22	I	Sh.	E.	38.0	51.0
28/03/2010	11.41.56	II	Sh.	E.	36.5	50.7
28/03/2010	11.54.40	I	Tr.	E.	35.2	50.2
28/03/2010	12.42.28	II	Tr.	E.	29.3	46.7
29/03/2010	6.23.02	I	Ec.	D.	21.4	14.6
29/03/2010	9.10.57	I	Occ.	R.	40.7	42.3
30/03/2010	3.28.05	II	Ec.	D.	-9.2	-17.2
30/03/2010	3.31.04	III	Sh.	I.	-8.7	-16.7
30/03/2010	3.37.51	I	Sh.	I.	-7.4	-15.5
30/03/2010	4.08.48	I	Tr.	I.	-0.8	-10.0
30/03/2010	5.37.49	III	Tr.	I.	14.5	6.6

Date	Time	M	Phe	Pha	h	h S
30/03/2010	5.53.52	I	Sh.	E.	17.2	9.5
30/03/2010	6.24.55	I	Tr.	E.	22.3	15.2
30/03/2010	6.57.50	III	Sh.	E.	27.3	21.2
30/03/2010	7.20.04	II	Occ.	R.	30.4	25.1
30/03/2010	9.05.11	III	Tr.	E.	40.6	41.9
31/03/2010	0.51.41	I	Ec.	D.	-36.5	-39.1
31/03/2010	3.41.22	I	Occ.	R.	-6.1	-14.6
31/03/2010	15.21.37	IV	Sh.	I.	1.7	23.9
31/03/2010	19.01.24	IV	Sh.	E.	-38.1	-16.2
31/03/2010	20.36.32	IV	Tr.	I.	-50.4	-31.2
31/03/2010	22.06.22	I	Sh.	I.	-53.8	-41.0
31/03/2010	22.07.06	II	Sh.	I.	-53.8	-41.1
31/03/2010	22.39.04	I	Tr.	I.	-52.3	-42.9
31/03/2010	23.14.42	II	Tr.	I.	-49.3	-43.6
01/04/2010	0.19.31	IV	Tr.	E.	-41.0	-41.4
01/04/2010	0.22.22	I	Sh.	E.	-40.6	-41.2
01/04/2010	0.55.09	I	Tr.	E.	-35.4	-38.4
01/04/2010	1.00.20	II	Sh.	E.	-34.5	-37.9
01/04/2010	2.08.06	II	Tr.	E.	-22.7	-29.4
01/04/2010	19.20.25	I	Ec.	D.	-41.4	-19.2
01/04/2010	22.11.51	I	Occ.	R.	-53.4	-41.0
02/04/2010	16.34.54	I	Sh.	I.	-13.3	11.0
02/04/2010	16.45.28	II	Ec.	D.	-15.3	9.1
02/04/2010	17.09.21	I	Tr.	I.	-19.6	4.7
02/04/2010	17.25.36	III	Ec.	D.	-22.6	1.9
02/04/2010	18.50.52	I	Sh.	E.	-37.3	-13.9
02/04/2010	19.25.23	I	Tr.	E.	-42.5	-19.8
02/04/2010	20.44.17	II	Occ.	R.	-51.4	-31.7
02/04/2010	23.13.33	III	Occ.	R.	-48.6	-42.8
03/04/2010	13.49.03	I	Ec.	D.	16.5	40.0
03/04/2010	16.42.12	I	Occ.	R.	-15.2	9.9
04/04/2010	11.03.25	I	Sh.	I.	38.6	53.7
04/04/2010	11.26.28	II	Sh.	I.	36.5	53.7
04/04/2010	11.39.36	I	Tr.	I.	35.0	53.4
04/04/2010	12.41.18	I	Tr.	I.	26.9	49.0
04/04/2010	13.19.23	I	Sh.	E.	20.9	44.5
04/04/2010	13.55.37	I	Tr.	E.	14.9	39.3
04/04/2010	14.19.37	II	Sh.	E.	10.7	35.5
04/04/2010	15.34.29	II	Tr.	E.	-2.5	22.5
05/04/2010	8.17.47	I	Ec.	D.	39.2	36.9
05/04/2010	11.12.38	I	Occ.	R.	37.6	54.1
06/04/2010	5.31.55	I	Sh.	I.	17.6	7.6
06/04/2010	6.02.48	II	Ec.	D.	22.7	13.3
06/04/2010	6.09.49	I	Tr.	I.	23.8	14.6
06/04/2010	7.31.49	III	Sh.	I.	35.1	29.5
06/04/2010	7.47.51	I	Tr.	E.	36.8	32.3
06/04/2010	8.25.47	I	Sh.	E.	40.1	38.5
06/04/2010	10.07.49	III	Tr.	I.	41.9	51.5
06/04/2010	10.08.22	II	Occ.	R.	41.9	51.6
06/04/2010	10.57.53	III	Sh.	E.	38.8	54.3
06/04/2010	13.33.25	III	Tr.	E.	17.7	43.1
07/04/2010	2.46.25	I	Ec.	D.	-11.9	-21.5
07/04/2010	5.42.58	I	Occ.	R.	20.0	10.0
08/04/2010	0.00.24	I	Sh.	I.	-40.1	-39.8
08/04/2010	0.40.01	I	Tr.	I.	-33.9	-37.1
08/04/2010	0.44.55	II	Sh.	I.	-33.0	-36.7
08/04/2010	2.06.51	II	Tr.	I.	-18.6	-27.1
08/04/2010	2.16.20	I	Sh.	E.	-16.8	-25.7
08/04/2010	2.55.57	I	Tr.	E.	-9.5	-19.6
08/04/2010	3.37.59	II	Sh.	E.	-0.9	-12.6
08/04/2010	4.59.48	II	Tr.	E.	13.3	2.4
08/04/2010	21.15.08	I	Ec.	D.	-53.2	-33.7
09/04/2010	0.13.22	I	Occ.	R.	-37.6	-38.7
09/04/2010	1.02.15	IV	Ec.	D.	-29.5	-34.7
09/04/2010	4.38.38	IV	Ec.	D.	10.2	-0.7
09/04/2010	7.28.11	IV	Occ.	D.	36.0	29.8
09/04/2010	11.01.26	IV	Occ.	R.	37.8	55.5
09/04/2010	18.28.55	I	Sh.	I.	-36.8	-8.6
09/04/2010	19.10.12	I	Tr.	I.	-42.9	-15.6
09/04/2010	19.20.07	II	Ec.	D.	-44.3	-17.3
09/04/2010	20.44.49	I	Tr.	E.	-52.2	-29.8
09/04/2010	21.26.06	I	Sh.	E.	-53.2	-34.5
09/04/2010	21.26.30	III	Ec.	D.	-53.2	-34.6
09/04/2010	23.32.16	II	Occ.	R.	-43.1	-40.0
10/04/2010	3.41.10	III	Occ.	R.	0.7	-11.4
10/04/2010	15.43.45	I	Ec.	D.	-8.0	22.0
10/04/2010	18.43.37	I	Occ.	R.	-39.5	-10.9
11/04/2010	12.57.25	I	Sh.	I.	21.4	49.3
11/04/2010	13.40.23	I	Tr.	I.	14.2	43.4
11/04/2010	14.04.17	II	Sh.	I.	10.0	39.6
11/04/2010	15.13.19	I	Sh.	E.	-2.1	27.7
11/04/2010	15.33.09	II	Tr.	I.	-6.5	24.2
11/04/2010	15.56.14	I	Tr.	E.	-10.8	19.9
11/04/2010	16.57.14	II	Sh.	E.	-22.0	8.7
11/04/2010	18.25.50	II	Tr.	E.	-37.1	-7.6
12/04/2010	10.12.27	I	Ec.	D.	41.2	54.2
12/04/2010	13.13.58	I	Occ.	R.	18.2	47.4

Date	Time	M	Phe	Pha	h	h S
13/04/2010	7.25.54	I	Sh.	I.	37.4	30.6
13/04/2010	8.10.31	I	Tr.	I.	41.2	38.3
13/04/2010	8.37.25	II	Ec.	D.	42.5	42.7
13/04/2010	9.41.47	I	Sh.	E.	42.6	51.5
13/04/2010	10.26.19	I	Tr.	E.	40.1	55.6
13/04/2010	11.33.22	III	Sh.	I.	33.1	56.8
13/04/2010	12.56.02	II	Occ.	R.	20.8	50.0
13/04/2010	14.37.33	III	Tr.	I.	3.1	34.5
13/04/2010	14.58.43	III	Sh.	E.	-0.4	30.8
13/04/2010	18.01.14	III	Tr.	E.	-34.0	-2.1
14/04/2010	4.41.04	I	Ec.	D.	13.6	0.9
14/04/2010	7.44.12	I	Occ.	R.	39.5	34.1
15/04/2010	1.54.22	I	Sh.	I.	-16.5	-26.4
15/04/2010	2.40.37	I	Tr.	I.	-7.9	-19.8
15/04/2010	3.22.40	II	Sh.	I.	0.5	-13.0
15/04/2010	4.10.15	I	Sh.	E.	8.8	-4.7
15/04/2010	4.56.23	I	Tr.	E.	16.9	3.8
15/04/2010	4.58.20	II	Tr.	I.	17.2	4.1
15/04/2010	6.15.32	II	Sh.	E.	29.5	18.3
15/04/2010	7.50.46	II	Tr.	E.	40.4	35.5
15/04/2010	23.09.47	I	Ec.	D.	-43.2	-38.0
16/04/2010	2.14.30	I	Occ.	R.	-12.1	-23.3
16/04/2010	20.22.51	I	Sh.	I.	-51.7	-25.0
16/04/2010	21.10.43	I	Tr.	I.	-52.5	-30.8
16/04/2010	21.54.44	II	Ec.	D.	-50.6	-34.8
16/04/2010	22.38.43	I	Sh.	E.	-46.6	-37.1
16/04/2010	23.26.26	I	Tr.	E.	-40.4	-37.6
17/04/2010	1.27.12	III	Ec.	D.	-20.2	-29.1
17/04/2010	2.19.37	II	Occ.	R.	-10.5	-22.2
17/04/2010	8.07.16	III	Occ.	R.	42.0	39.0
17/04/2010	9.39.32	IV	Sh.	I.	42.6	52.6
17/04/2010	13.10.11	IV	Sh.	E.	16.5	49.3
17/04/2010	17.35.17	IV	Tr.	I.	-31.6	3.0
17/04/2010	17.38.22	I	Ec.	D.	-32.1	2.5
17/04/2010	20.44.38	I	Occ.	R.	-52.4	-27.5
17/04/2010	20.54.48	IV	Tr.	E.	-52.5	-28.7
18/04/2010	14.51.21	I	Sh.	I.	-1.6	33.1
18/04/2010	15.40.48	I	Tr.	I.	-11.6	24.1
18/04/2010	16.41.58	II	Sh.	I.	-22.8	12.8
18/04/2010	17.07.12	I	Sh.	E.	-27.2	8.2
18/04/2010	17.56.29	I	Tr.	E.	-35.5	-0.3
18/04/2010	18.24.12	II	Tr.	I.	-39.7	-5.8
18/04/2010	19.34.42	II	Sh.	E.	-48.5	-17.5
18/04/2010	21.16.20	II	Tr.	E.	-52.1	-30.8
19/04/2010	12.07.03	I	Ec.	D.	26.0	56.9
19/04/2010	15.14.52	I	Occ.	R.	-7.3	29.0
20/04/2010	9.19.49	I	Sh.	I.	43.2	51.1
20/04/2010	10.10.49	I	Tr.	I.	40.2	56.9
20/04/2010	11.12.04	II	Ec.	D.	33.5	59.6
20/04/2010	11.25.38	I	Sh.	E.	30.3	59.1
20/04/2010	12.26.28	I	Tr.	E.	22.5	55.4
20/04/2010	15.34.14	III	Sh.	I.	-11.4	25.7
20/04/2010	15.43.05	II	Occ.	R.	-13.1	24.1
20/04/2010	18.58.49	III	Sh.	E.	-45.1	-11.3
20/04/2010	19.05.09	III	Tr.	I.	-45.8	-12.3
20/04/2010	22.26.48	III	Tr.	E.	-46.2	-35.3
21/04/2010	6.35.39	I	Ec.	D.	35.1	23.6
21/04/2010	9.44.59	I	Occ.	R.	41.9	54.6
22/04/2010	3.48.16	I	Sh.	I.	9.2	-6.7
22/04/2010	4.40.49	I	Tr.	I.	18.4	2.9
22/04/2010	6.00.19	II	Sh.	I.	30.9	17.4
22/04/2010	6.04.06	I	Sh.	E.	31.4	18.1
22/04/2010	6.56.26	I	Tr.	E.	37.9	27.7
22/04/2010	7.48.57	II	Tr.	I.	42.3	37.2
22/04/2010	8.52.57	II	Sh.	E.	43.8	47.8
22/04/2010	10.40.48	II	Tr.	E.	36.7	59.6
23/04/2010	1.04.21	I	Ec.	D.	-20.6	-29.6
23/04/2010	4.15.10	I	Occ.	R.	14.6	-0.9
23/04/2010	22.16.45	I	Sh.	I.	-46.1	-33.9
23/04/2010	23.10.48	I	Tr.	I.	-39.0	-35.3
24/04/2010	0.29.20	II	Ec.	D.	-26.2	-32.3
24/04/2010	0.32.33	I	Sh.	E.	-25.6	-32.1
24/04/2010	1.26.22	I	Tr.	E.	-15.9	-26.9
24/04/2010	5.06.15	II	Occ.	R.	23.8	7.9
24/04/2010	5.28.00	III	Ec.	D.	27.2	11.9
24/04/2010	8.52.31	III	Ec.	R.	43.9	48.3
24/04/2010	9.11.01	III	Occ.	D.	43.4	51.1
24/04/2010	12.31.57	III	Occ.	R.	19.7	55.9
24/04/2010	19.32.55	I	Ec.	D.	-49.5	-15.8
24/04/2010	22.45.11	I	Occ.	R.	-42.1	-34.7
25/04/2010	16.45.14	I	Sh.	I.	-26.8	13.5
25/04/2010	17.40.46	I	Tr.	I.	-36.0	3.5
25/04/2010	19.01.01	I	Sh.	E.	-46.8	-10.6
25/04/2010	19.17.49	IV	Ec.	D.	-48.4	-13.3
25/04/2010	19.19.33	II	Sh.	I.	-48.6	-13.5
25/04/2010	19.56.18	I	Tr.	E.	-51.0	-19.0
25/04/2010	21.14.20	II	Tr.	I.	-50.7	-28.6

Date	Time	M	Phe	Pha	h	h S
25/04/2010	22.12.03	II	Sh.	E.	-45.8	-33.1
25/04/2010	22.45.20	IV	Ec.	R.	-41.6	-34.3
26/04/2010	0.05.51	II	Tr.	E.	-29.0	-33.1
26/04/2010	4.11.39	IV	Occ.	D.	15.8	-0.8
26/04/2010	7.20.21	IV	Occ.	R.	41.5	33.1
26/04/2010	14.01.35	I	Ec.	D.	2.9	43.3
26/04/2010	17.15.17	I	Occ.	R.	-32.4	8.2
27/04/2010	11.13.40	I	Sh.	I.	30.7	61.9
27/04/2010	12.10.41	I	Tr.	I.	21.9	59.0
27/04/2010	13.29.27	I	Sh.	E.	8.1	48.8
27/04/2010	13.46.38	II	Ec.	D.	5.0	46.0
27/04/2010	14.26.10	I	Tr.	E.	-1.7	39.3
27/04/2010	18.29.18	II	Occ.	R.	-43.7	-4.8
27/04/2010	19.35.24	III	Sh.	I.	-50.1	-15.5
27/04/2010	22.59.11	III	Sh.	E.	-38.6	-33.9
27/04/2010	23.31.23	III	Tr.	I.	-33.6	-33.8
28/04/2010	2.50.48	III	Tr.	E.	2.6	-14.4
28/04/2010	8.30.10	I	Ec.	D.	44.4	45.8
28/04/2010	11.45.16	I	Occ.	R.	25.5	61.2
29/04/2010	5.42.08	I	Sh.	I.	31.9	15.7
29/04/2010	6.40.34	I	Tr.	I.	39.1	26.5
29/04/2010	7.57.54	I	Sh.	E.	44.2	40.5
29/04/2010	8.37.54	II	Sh.	I.	44.3	47.3
29/04/2010	8.56.01	I	Tr.	E.	43.8	50.2
29/04/2010	10.38.37	II	Tr.	I.	34.8	61.7
29/04/2010	11.30.18	II	Sh.	E.	27.4	62.2
29/04/2010	13.29.51	II	Tr.	E.	7.0	49.2
30/04/2010	2.58.50	I	Ec.	D.	5.3	-12.6
30/04/2010	6.15.19	I	Occ.	R.	36.7	22.0
01/05/2010	0.10.35	I	Sh.	I.	-25.2	-31.3
01/05/2010	1.10.26	I	Tr.	I.	-14.4	-26.6
01/05/2010	2.26.20	I	Sh.	E.	0.3	-17.2
01/05/2010	3.03.54	II	Ec.	D.	6.8	-11.6
01/05/2010	3.25.50	I	Tr.	E.	10.8	-8.1
01/05/2010	7.52.04	II	Occ.	R.	44.3	40.0
01/05/2010	9.28.51	III	Ec.	D.	41.6	55.5
01/05/2010	12.52.36	III	Ec.	R.	12.7	55.1
01/05/2010	13.36.04	III	Occ.	D.	4.9	48.6
01/05/2010	16.54.49	III	Occ.	R.	-31.4	12.8
01/05/2010	21.27.23	I	Ec.	D.	-47.9	-28.2
02/05/2010	0.45.13	I	Occ.	R.	-18.4	-28.6
02/05/2010	18.39.03	I	Sh.	I.	-46.3	-5.5
02/05/2010	19.40.17	I	Tr.	I.	-50.7	-15.1
02/05/2010	20.54.48	I	Sh.	E.	-50.0	-24.7
02/05/2010	21.55.39	I	Tr.	E.	-44.6	-30.0
02/05/2010	21.57.02	II	Sh.	I.	-44.4	-30.1
03/05/2010	0.03.25	II	Tr.	I.	-25.2	-31.1
03/05/2010	0.49.17	II	Sh.	E.	-17.0	-28.0
03/05/2010	2.54.18	II	Tr.	E.	6.4	-12.6
03/05/2010	15.56.02	I	Ec.	D.	-22.2	24.0
03/05/2010	19.15.10	I	Occ.	R.	-49.6	-11.1
04/05/2010	3.57.58	IV	Sh.	I.	18.3	-1.2
04/05/2010	7.18.34	IV	Sh.	E.	43.6	34.6
04/05/2010	13.07.29	I	Sh.	I.	8.4	53.7
04/05/2010	14.10.04	I	Tr.	I.	-2.8	43.4
04/05/2010	14.16.48	IV	Tr.	I.	-4.4	42.2
04/05/2010	15.23.13	I	Sh.	E.	-16.8	30.2
04/05/2010	16.21.14	II	Ec.	D.	-27.1	19.5
04/05/2010	16.25.23	I	Tr.	E.	-27.9	18.7
04/05/2010	17.06.32	IV	Tr.	E.	-34.6	11.2
04/05/2010	21.14.42	II	Occ.	R.	-48.0	-26.2
04/05/2010	23.35.48	III	Sh.	I.	-28.7	-31.5
05/05/2010	2.58.47	III	Sh.	E.	8.4	-11.4
05/05/2010	3.55.02	III	Tr.	I.	18.4	-1.5
05/05/2010	7.12.10	III	Tr.	E.	43.5	33.6
05/05/2010	10.24.37	I	Ec.	D.	34.5	62.6
05/05/2010	13.45.01	I	Occ.	R.	1.3	47.9
06/05/2010	7.35.56	I	Sh.	I.	44.7	38.1
06/05/2010	8.39.50	I	Tr.	I.	44.0	49.3
06/05/2010	9.51.39	I	Sh.	E.	38.2	59.7
06/05/2010	10.55.07	I	Tr.	E.	29.8	64.4
06/05/2010	11.15.19	II	Sh.	I.	26.7	64.5
06/05/2010	13.27.09	II	Tr.	I.	3.8	51.0
06/05/2010	14.07.27	II	Sh.	E.	-3.6	44.2
06/05/2010	16.17.42	II	Tr.	E.	-27.5	20.4
07/05/2010	4.53.16	I	Ec.	D.	29.0	8.5
07/05/2010	8.14.55	I	Occ.	R.	44.8	45.3
08/05/2010	2.04.22	I	Sh.	I.	0.7	-18.4
08/05/2010	3.09.33	I	Tr.	I.	12.2	-9.1
08/05/2010	4.20.05	I	Sh.	E.	24.4	2.9
08/05/2010	5.24.47	I	Tr.	E.	34.1	14.3
08/05/2010	5.38.32	II	Ec.	D.	35.9	16.9
08/05/2010	10.37.02	II	Occ.	R.	31.6	64.2
08/05/2010	13.30.28	III	Ec.	D.	2.2	50.9
08/05/2010	16.53.26	III	Ec.	R.	-34.4	14.2
08/05/2010	17.59.58	III	Occ.	D.	-43.7	2.5
08/05/2010	21.16.24	III	Occ.	R.	-46.4	-25.4

Date	Time	M	Phe	Pha	h	h S
08/05/2010	23.21.48	I	Ec.	D.	-28.7	-30.7
09/05/2010	2.44.39	I	Occ.	R.	8.4	-12.6
09/05/2010	20.32.51	I	Sh.	I.	-49.5	-20.6
09/05/2010	21.39.17	I	Tr.	I.	-43.4	-27.1
09/05/2010	22.48.33	I	Sh.	E.	-33.6	-30.3
09/05/2010	23.54.29	I	Tr.	E.	-22.4	-29.5
10/05/2010	0.34.23	II	Sh.	I.	-15.2	-27.3
10/05/2010	2.51.19	II	Tr.	I.	10.2	-11.4
10/05/2010	3.26.21	II	Sh.	E.	16.5	-6.0
10/05/2010	5.41.30	II	Tr.	E.	37.2	17.8
10/05/2010	17.50.26	I	Ec.	D.	-43.2	4.5
10/05/2010	21.14.28	I	Occ.	R.	-45.8	-24.7
11/05/2010	15.01.16	I	Sh.	I.	-16.6	35.4
11/05/2010	16.08.55	I	Tr.	I.	-28.5	22.9
11/05/2010	17.16.58	I	Sh.	E.	-39.2	10.5
11/05/2010	18.24.05	I	Tr.	E.	-47.1	-0.6
11/05/2010	18.55.51	II	Ec.	D.	-49.4	-6.5
11/05/2010	23.59.08	II	Occ.	R.	-20.4	-28.8
12/05/2010	3.36.00	III	Sh.	I.	19.4	-3.8
12/05/2010	6.58.10	III	Sh.	E.	44.5	32.3
12/05/2010	8.16.26	III	Tr.	I.	44.6	46.5
12/05/2010	11.31.12	III	Tr.	E.	21.2	65.7
12/05/2010	12.18.59	I	Ec.	D.	12.9	61.8
12/05/2010	13.33.08	IV	Ec.	D.	-0.2	51.2
12/05/2010	15.44.09	I	Occ.	R.	-24.8	27.6
12/05/2010	16.50.58	IV	Ec.	R.	-35.8	15.3
13/05/2010	0.34.08	IV	Occ.	D.	-13.4	-26.5
13/05/2010	3.12.11	IV	Occ.	R.	15.8	-7.7
13/05/2010	9.29.42	I	Sh.	I.	38.5	58.4
13/05/2010	10.38.33	I	Tr.	I.	29.3	65.6
13/05/2010	11.45.23	I	Sh.	E.	18.3	65.2
13/05/2010	12.53.40	I	Tr.	E.	6.1	57.5
13/05/2010	13.52.38	II	Sh.	I.	-5.0	48.0
13/05/2010	16.14.27	II	Tr.	I.	-30.4	22.1
13/05/2010	16.44.29	II	Sh.	E.	-35.2	16.6
13/05/2010	19.04.17	II	Tr.	E.	-49.9	-7.5
14/05/2010	6.47.37	I	Ec.	D.	44.4	30.6
14/05/2010	10.13.53	I	Occ.	R.	32.5	63.9
15/05/2010	3.58.08	I	Sh.	I.	24.9	0.7
15/05/2010	5.08.07	I	Tr.	I.	35.3	12.5
15/05/2010	6.13.48	I	Sh.	E.	42.4	24.5
15/05/2010	7.23.11	I	Tr.	E.	45.6	37.4
15/05/2010	8.13.10	II	Ec.	D.	44.5	46.4
15/05/2010	13.20.57	II	Occ.	R.	0.3	53.7
15/05/2010	17.31.28	III	Ec.	D.	-42.6	8.5
15/05/2010	20.53.37	III	Ec.	R.	-45.9	-21.6
15/05/2010	22.20.55	III	Occ.	D.	-34.5	-28.0
16/05/2010	1.16.08	I	Ec.	D.	-3.2	-22.2
16/05/2010	1.34.56	III	Occ.	R.	0.4	-20.2
16/05/2010	4.43.28	I	Occ.	R.	32.4	8.3
16/05/2010	22.26.36	I	Sh.	I.	-33.1	-28.0
16/05/2010	23.37.42	I	Tr.	I.	-21.0	-28.4
17/05/2010	0.42.16	I	Sh.	E.	-9.3	-25.0
17/05/2010	1.52.44	I	Tr.	E.	4.1	-18.0
17/05/2010	3.11.38	II	Sh.	I.	18.2	-7.0
17/05/2010	5.37.56	II	Tr.	I.	39.8	18.2
17/05/2010	6.03.18	II	Sh.	E.	42.2	22.8
17/05/2010	8.27.22	II	Tr.	E.	43.4	49.2
17/05/2010	19.44.45	I	Ec.	D.	-49.9	-12.7
17/05/2010	23.13.06	I	Occ.	R.	-24.7	-28.5
18/05/2010	16.55.01	I	Sh.	I.	-38.9	15.5
18/05/2010	18.07.12	I	Tr.	I.	-47.1	3.0
18/05/2010	19.10.40	I	Sh.	E.	-50.1	-7.6
18/05/2010	20.22.11	I	Tr.	E.	-47.6	-17.4
18/05/2010	21.30.30	II	Ec.	D.	-40.3	-24.3
19/05/2010	2.42.29	II	Occ.	R.	14.3	-11.0
19/05/2010	7.36.21	III	Sh.	I.	45.7	40.3
19/05/2010	10.57.43	III	Sh.	E.	23.3	67.7
19/05/2010	12.35.42	III	Tr.	I.	6.1	61.2
19/05/2010	14.13.17	I	Ec.	D.	-12.2	45.3
19/05/2010	15.48.01	III	Tr.	E.	-29.0	27.9
19/05/2010	17.42.37	I	Occ.	R.	-45.1	7.2
20/05/2010	11.23.27	I	Sh.	I.	18.4	67.8
20/05/2010	12.36.40	I	Tr.	I.	5.3	61.2
20/05/2010	13.39.06	I	Sh.	E.	-6.5	51.5
20/05/2010	14.51.37	I	Tr.	E.	-19.8	38.5
20/05/2010	16.29.48	II	Sh.	I.	-36.1	20.3
20/05/2010	19.00.20	II	Tr.	I.	-50.0	-5.6
20/05/2010	19.21.20	II	Sh.	E.	-50.0	-8.8
20/05/2010	21.49.25	II	Tr.	E.	-36.6	-25.3
20/05/2010	22.17.03	IV	Sh.	I.	-32.3	-26.8
21/05/2010	1.26.48	IV	Sh.	E.	2.0	-20.2
21/05/2010	8.41.55	I	Ec.	D.	41.3	52.2
21/05/2010	10.35.07	IV	Tr.	I.	26.1	67.1
21/05/2010	12.12.10	I	Occ.	R.	9.2	64.4
21/05/2010	12.46.18	IV	Tr.	E.	3.1	60.0
22/05/2010	5.51.52	I	Sh.	I.	43.0	21.4

Date	Time	M	Phe	Pha	h	h S
22/05/2010	7.06.05	I	Tr.	I.	46.1	35.1
22/05/2010	8.07.30	I	Sh.	E.	43.9	46.3
22/05/2010	9.20.58	I	Tr.	E.	36.5	58.7
22/05/2010	10.47.53	II	Ec.	D.	23.5	68.0
22/05/2010	16.03.47	II	Occ.	R.	-33.0	25.4
22/05/2010	21.32.46	III	Ec.	D.	-37.9	-23.7
23/05/2010	0.54.03	III	Ec.	R.	-2.6	-22.9
23/05/2010	2.39.31	III	Occ.	D.	16.3	-10.9
23/05/2010	3.10.25	I	Ec.	D.	21.7	-6.3
23/05/2010	5.51.01	III	Occ.	R.	43.2	21.3
23/05/2010	6.41.35	I	Occ.	R.	45.9	30.6
24/05/2010	0.20.20	I	Sh.	I.	-8.7	-25.2
24/05/2010	1.35.30	I	Tr.	I.	5.5	-18.8
24/05/2010	2.35.57	I	Sh.	E.	16.3	-11.2
24/05/2010	3.50.22	I	Tr.	E.	28.8	0.7
24/05/2010	5.48.41	II	Sh.	I.	43.4	21.0
24/05/2010	8.23.01	II	Tr.	I.	42.3	49.3
24/05/2010	8.40.02	II	Sh.	E.	40.7	52.3
24/05/2010	11.11.42	II	Tr.	E.	18.4	68.8
24/05/2010	21.39.01	I	Ec.	D.	-35.9	-23.8
25/05/2010	1.11.01	I	Occ.	R.	1.7	-21.1
25/05/2010	18.48.45	I	Sh.	I.	-49.7	-2.5
25/05/2010	20.04.49	I	Tr.	I.	-46.7	-14.0
25/05/2010	21.04.22	I	Sh.	E.	-40.3	-20.7
25/05/2010	22.19.38	I	Tr.	E.	-28.9	-26.0
26/05/2010	0.05.15	II	Ec.	D.	-10.2	-25.6
26/05/2010	5.24.42	II	Occ.	R.	42.0	16.8
26/05/2010	11.36.54	III	Sh.	I.	12.8	68.4
26/05/2010	14.57.26	III	Sh.	E.	-24.0	38.2
26/05/2010	16.07.32	I	Ec.	D.	-35.5	25.2
26/05/2010	16.52.27	III	Tr.	I.	-41.6	17.0
26/05/2010	19.40.21	I	Occ.	R.	-48.2	-10.6
26/05/2010	20.02.15	III	Tr.	E.	-46.6	-13.5
27/05/2010	13.17.11	I	Sh.	I.	-6.4	56.2
27/05/2010	14.34.08	I	Tr.	I.	-20.5	42.6
27/05/2010	15.32.47	I	Sh.	E.	-30.5	31.8
27/05/2010	16.48.55	I	Tr.	E.	-41.6	17.8
27/05/2010	19.06.49	II	Sh.	I.	-49.4	-5.5
27/05/2010	21.44.41	II	Tr.	I.	-33.4	-23.7
27/05/2010	21.58.02	II	Sh.	E.	-31.3	-24.5
28/05/2010	0.32.59	II	Tr.	E.	-3.4	-23.7
28/05/2010	10.36.08	I	Ec.	D.	22.3	68.3
28/05/2010	14.09.43	I	Occ.	R.	-16.7	47.2
29/05/2010	7.45.36	I	Sh.	I.	44.2	43.0
29/05/2010	7.48.39	IV	Ec.	D.	44.0	43.6
29/05/2010	9.03.22	I	Tr.	I.	36.1	56.7
29/05/2010	10.01.12	I	Sh.	E.	27.6	65.1
29/05/2010	10.56.00	IV	Ec.	R.	18.4	69.5
29/05/2010	11.18.06	I	Tr.	E.	14.5	69.6
29/05/2010	13.22.38	II	Ec.	D.	-8.6	55.5
29/05/2010	18.45.21	II	Occ.	R.	-49.5	-1.2
29/05/2010	20.30.23	IV	Occ.	D.	-42.6	-16.5
29/05/2010	22.28.02	IV	Occ.	R.	-25.1	-25.6
30/05/2010	1.33.16	III	Ec.	D.	8.9	-18.2
30/05/2010	4.53.40	III	Ec.	R.	40.4	11.6
30/05/2010	5.04.38	I	Ec.	D.	41.5	13.6
30/05/2010	6.54.34	III	Occ.	D.	46.4	33.6
30/05/2010	8.38.56	I	Occ.	R.	38.8	52.6
30/05/2010	10.03.32	III	Occ.	R.	26.7	65.5
31/05/2010	2.14.04	I	Sh.	I.	16.9	-13.3
31/05/2010	3.32.37	I	Tr.	I.	30.0	-1.2
31/05/2010	4.29.39	I	Sh.	E.	38.0	7.6
31/05/2010	5.47.19	I	Tr.	E.	45.2	21.3
31/05/2010	8.25.39	II	Sh.	I.	40.0	50.4
31/05/2010	11.06.33	II	Tr.	I.	15.4	69.9
31/05/2010	11.16.40	II	Sh.	E.	13.6	69.9
31/05/2010	13.54.27	II	Tr.	E.	-15.6	50.3
31/05/2010	23.33.13	I	Ec.	D.	-12.2	-25.8
01/06/2010	3.08.10	I	Occ.	R.	26.7	-5.6
01/06/2010	20.42.28	I	Sh.	I.	-39.7	-17.4
01/06/2010	22.01.45	I	Tr.	I.	-27.7	-24.0
01/06/2010	22.58.03	I	Sh.	E.	-17.9	-25.8
02/06/2010	0.16.24	I	Tr.	E.	-3.1	-24.1
02/06/2010	2.40.03	II	Ec.	D.	22.7	-9.7
02/06/2010	8.05.35	II	Occ.	R.	41.6	46.9
02/06/2010	15.38.18	III	Sh.	I.	-34.3	31.4
02/06/2010	18.01.44	I	Ec.	D.	-48.9	5.9
02/06/2010	18.57.59	III	Sh.	E.	-48.7	-3.0
02/06/2010	21.07.08	III	Tr.	I.	-35.7	-19.8
02/06/2010	21.37.18	I	Occ.	R.	-31.1	-22.3
03/06/2010	0.14.21	III	Tr.	E.	-2.7	-24.1
03/06/2010	15.10.55	I	Sh.	I.	-30.5	36.6
03/06/2010	16.30.53	I	Tr.	I.	-41.9	21.9
03/06/2010	17.26.29	I	Sh.	E.	-47.2	12.0
03/06/2010	18.45.30	I	Tr.	E.	-48.9	-0.6
03/06/2010	21.43.43	II	Sh.	I.	-29.5	-22.6
04/06/2010	0.27.24	II	Tr.	I.	0.4	-23.2

Date	Time	M	Phe	Pha	h	h S
04/06/2010	0.34.35	II	Sh.	E.	1.6	-22.8
04/06/2010	3.14.55	II	Tr.	E.	29.6	-4.3
04/06/2010	12.30.19	I	Ec.	D.	-1.7	64.3
04/06/2010	16.06.28	I	Occ.	R.	-39.2	26.4
05/06/2010	9.39.19	I	Sh.	I.	27.6	62.8
05/06/2010	10.59.56	I	Tr.	I.	13.7	70.4
05/06/2010	11.54.53	I	Sh.	E.	3.8	68.5
05/06/2010	13.14.29	I	Tr.	E.	-11.3	57.7
05/06/2010	15.57.30	II	Ec.	D.	-38.4	28.2
05/06/2010	21.25.34	II	Occ.	R.	-31.2	-21.0
06/06/2010	5.33.36	III	Ec.	D.	45.9	19.1
06/06/2010	6.58.48	I	Ec.	D.	45.8	34.7
06/06/2010	8.53.08	III	Ec.	R.	34.2	55.5
06/06/2010	10.35.28	I	Occ.	R.	17.5	69.3
06/06/2010	11.06.25	III	Occ.	D.	12.0	70.7
06/06/2010	14.12.48	III	Occ.	R.	-22.3	47.6
06/06/2010	16.36.00	IV	Sh.	I.	-43.5	21.2
06/06/2010	19.33.55	IV	Sh.	E.	-45.3	-8.3
07/06/2010	4.07.47	I	Sh.	I.	38.6	4.3
07/06/2010	5.28.59	I	Tr.	I.	45.9	18.3
07/06/2010	6.23.20	I	Sh.	E.	46.9	28.2
07/06/2010	6.26.28	IV	Tr.	I.	46.9	28.8
07/06/2010	7.39.32	IV	Tr.	E.	42.7	42.3
07/06/2010	7.43.31	I	Tr.	E.	42.3	43.0
07/06/2010	11.02.25	II	Sh.	I.	12.1	70.7
07/06/2010	13.48.20	II	Tr.	I.	-18.6	52.1
07/06/2010	13.53.05	II	Sh.	E.	-19.4	51.2
07/06/2010	16.35.25	II	Tr.	E.	-43.8	21.4
08/06/2010	1.27.22	I	Ec.	D.	13.7	-18.0
08/06/2010	5.04.30	I	Occ.	R.	44.6	14.0
08/06/2010	22.36.12	I	Sh.	I.	-17.3	-24.6
08/06/2010	23.57.56	I	Tr.	I.	-1.4	-24.2
09/06/2010	0.51.44	I	Sh.	E.	7.9	-21.1
09/06/2010	2.12.25	I	Tr.	E.	22.3	-12.8
09/06/2010	5.14.59	II	Ec.	D.	45.6	15.8
09/06/2010	10.45.06	II	Occ.	R.	14.1	70.2
09/06/2010	19.39.02	III	Sh.	I.	-43.6	-8.7
09/06/2010	19.55.52	I	Ec.	D.	-41.8	-11.0
09/06/2010	22.57.50	III	Sh.	E.	-12.7	-25.0
09/06/2010	23.33.25	I	Occ.	R.	-6.1	-24.9
10/06/2010	1.17.50	III	Tr.	I.	13.3	-18.8
10/06/2010	4.22.24	III	Tr.	E.	41.6	6.8
10/06/2010	17.04.38	I	Sh.	I.	-47.0	16.5
10/06/2010	18.26.52	I	Tr.	I.	-48.4	2.6
10/06/2010	19.20.11	I	Sh.	E.	-45.1	-5.9
10/06/2010	20.41.18	I	Tr.	E.	-35.2	-16.3
11/06/2010	0.20.26	II	Sh.	I.	3.6	-23.1
11/06/2010	3.08.16	II	Tr.	I.	32.5	-5.0
11/06/2010	3.10.57	II	Sh.	E.	32.9	-4.6
11/06/2010	5.55.00	II	Tr.	E.	47.2	23.1
11/06/2010	14.24.27	I	Ec.	D.	-27.1	45.9
11/06/2010	18.02.22	I	Occ.	R.	-48.8	6.6
12/06/2010	11.33.03	I	Sh.	I.	3.6	70.7
12/06/2010	12.55.42	I	Tr.	I.	-12.0	61.4
12/06/2010	13.48.35	I	Sh.	E.	-21.5	52.5
12/06/2010	15.10.05	I	Tr.	E.	-34.8	37.6
12/06/2010	18.32.29	II	Ec.	D.	-47.8	1.9
13/06/2010	0.04.20	II	Occ.	R.	2.0	-23.7
13/06/2010	8.52.55	I	Ec.	D.	30.8	55.6
13/06/2010	9.34.07	III	Ec.	D.	24.2	62.3
13/06/2010	12.31.09	I	Occ.	R.	-8.1	65.0
13/06/2010	12.52.48	III	Ec.	R.	-12.1	61.9
13/06/2010	15.15.12	III	Occ.	D.	-36.1	36.7
13/06/2010	18.19.00	III	Occ.	R.	-48.2	4.1
14/06/2010	6.01.31	I	Sh.	I.	47.2	24.2
14/06/2010	7.24.33	I	Tr.	I.	42.0	39.6
14/06/2010	8.17.03	I	Sh.	E.	35.6	49.2
14/06/2010	9.38.54	I	Tr.	E.	22.8	63.0
14/06/2010	13.39.02	II	Sh.	I.	-21.0	54.3
14/06/2010	16.28.13	II	Tr.	I.	-45.1	23.3
14/06/2010	16.29.20	II	Sh.	E.	-45.2	23.1
14/06/2010	19.14.31	II	Tr.	E.	-44.1	-4.7
15/06/2010	2.04.59	IV	Ec.	D.	24.8	-13.6
15/06/2010	3.21.28	I	Ec.	D.	36.5	-2.5
15/06/2010	5.00.58	IV	Ec.	R.	46.2	13.4
15/06/2010	6.59.57	I	Occ.	R.	44.1	35.0
15/06/2010	16.00.01	IV	Occ.	D.	-42.6	28.5
15/06/2010	16.52.41	IV	Occ.	R.	-47.1	19.0
16/06/2010	0.29.56	I	Sh.	I.	8.6	-22.3
16/06/2010	1.53.17	I	Tr.	I.	23.4	-14.9
16/06/2010	2.45.27	I	Sh.	E.	31.9	-8.3
16/06/2010	4.07.35	I	Tr.	E.	42.5	4.4
16/06/2010	7.50.00	II	Ec.	D.	38.4	44.3
16/06/2010	13.22.59	II	Occ.	R.	-19.4	57.2
16/06/2010	21.49.57	I	Ec.	D.	-20.3	-21.9
16/06/2010	23.40.05	III	Sh.	I.	0.4	-24.4
17/06/2010	1.28.38	I	Occ.	R.	19.8	-17.5

Date	Time	M	Phe	Pha	h	h S
17/06/2010	2.57.57	III	Sh.	E.	34.3	-6.6
17/06/2010	5.25.08	III	Tr.	I.	47.3	17.6
17/06/2010	8.27.05	III	Tr.	E.	32.8	51.0
17/06/2010	18.58.23	I	Sh.	I.	-44.6	-1.4
17/06/2010	20.22.00	I	Tr.	I.	-34.2	-13.7
17/06/2010	21.13.54	I	Sh.	E.	-25.9	-19.1
17/06/2010	22.36.16	I	Tr.	E.	-11.3	-24.1
18/06/2010	2.57.02	II	Sh.	I.	34.7	-6.7
18/06/2010	5.47.12	II	Sh.	E.	47.4	21.6
18/06/2010	5.47.14	II	Tr.	I.	47.4	21.6
18/06/2010	8.33.10	II	Tr.	E.	31.3	52.0
18/06/2010	16.18.32	I	Ec.	D.	-45.3	25.3
18/06/2010	19.57.20	I	Occ.	R.	-37.2	-10.5
19/06/2010	13.26.48	I	Sh.	I.	-21.8	56.7
19/06/2010	14.50.36	I	Tr.	I.	-35.4	41.6
19/06/2010	15.42.18	I	Sh.	E.	-42.1	32.0
19/06/2010	17.04.50	I	Tr.	E.	-48.2	17.0
19/06/2010	21.07.35	II	Ec.	D.	-25.7	-18.4
20/06/2010	2.41.26	II	Occ.	R.	33.5	-8.9
20/06/2010	10.47.00	I	Ec.	D.	7.0	70.6
20/06/2010	13.34.43	III	Ec.	D.	-23.8	55.4
20/06/2010	14.25.52	I	Occ.	R.	-32.2	46.2
20/06/2010	16.52.31	III	Ec.	R.	-47.8	19.2
20/06/2010	19.20.16	III	Occ.	D.	-41.0	-5.3
20/06/2010	22.21.31	III	Occ.	R.	-12.0	-23.5
21/06/2010	7.55.17	I	Sh.	I.	35.4	45.1
21/06/2010	9.19.14	I	Tr.	I.	22.1	59.8
21/06/2010	10.10.46	I	Sh.	E.	13.0	67.3
21/06/2010	11.33.26	I	Tr.	E.	-1.7	71.0
21/06/2010	16.15.30	II	Sh.	I.	-45.9	26.0
21/06/2010	19.05.27	II	Sh.	E.	-42.3	-2.5
21/06/2010	19.06.06	II	Tr.	I.	-42.2	-2.7
21/06/2010	21.51.37	II	Tr.	E.	-16.7	-21.9
22/06/2010	5.15.32	I	Ec.	D.	47.6	15.8
22/06/2010	8.54.25	I	Occ.	R.	25.8	55.6
23/06/2010	2.23.42	I	Sh.	I.	32.5	-11.4
23/06/2010	3.47.45	I	Tr.	I.	43.2	1.2
23/06/2010	4.39.11	I	Sh.	E.	46.8	9.4
23/06/2010	6.01.54	I	Tr.	E.	46.4	24.1
23/06/2010	10.25.10	II	Ec.	D.	9.1	68.8
23/06/2010	10.55.36	IV	Sh.	I.	3.6	71.0
23/06/2010	13.40.23	IV	Sh.	E.	-26.5	54.5
23/06/2010	15.59.13	II	Occ.	R.	-45.1	29.1
23/06/2010	23.44.01	I	Ec.	D.	5.6	-24.3
24/06/2010	3.22.52	I	Occ.	R.	41.0	-2.5
24/06/2010	3.40.28	III	Sh.	I.	42.8	0.2
24/06/2010	6.57.24	III	Sh.	E.	41.5	34.2
24/06/2010	9.28.00	III	Tr.	I.	18.8	61.1
24/06/2010	12.27.19	III	Tr.	E.	-14.3	66.0
24/06/2010	20.52.09	I	Sh.	I.	-25.2	-16.8
24/06/2010	22.16.14	I	Tr.	I.	-10.2	-23.3
24/06/2010	23.07.38	I	Sh.	E.	0.0	-24.6
25/06/2010	0.30.21	I	Tr.	E.	14.7	-22.3
25/06/2010	5.33.27	II	Sh.	I.	47.3	18.8
25/06/2010	8.23.14	II	Sh.	E.	29.2	50.0
25/06/2010	8.24.05	II	Tr.	I.	29.0	50.1
25/06/2010	11.09.14	II	Tr.	E.	0.1	71.4
25/06/2010	18.12.35	I	Ec.	D.	-45.8	5.6
25/06/2010	21.51.19	I	Occ.	R.	-14.1	-21.9
26/06/2010	15.20.34	I	Sh.	I.	-42.3	36.3
26/06/2010	16.44.37	I	Tr.	I.	-48.1	20.8
26/06/2010	17.36.02	I	Sh.	E.	-47.6	11.8
26/06/2010	18.58.41	I	Tr.	E.	-40.8	-1.2
26/06/2010	23.42.52	II	Ec.	D.	7.4	-24.4
27/06/2010	5.16.50	II	Occ.	R.	47.6	15.7
27/06/2010	12.41.02	I	Ec.	D.	-18.6	64.1
27/06/2010	16.19.37	I	Occ.	R.	-47.3	25.4
27/06/2010	17.36.08	III	Ec.	D.	-47.4	11.7
27/06/2010	20.53.02	III	Ec.	R.	-23.1	-17.0
27/06/2010	23.22.11	III	Occ.	D.	4.4	-24.7
28/06/2010	2.20.55	III	Occ.	R.	34.9	-12.0
28/06/2010	9.49.04	I	Sh.	I.	12.5	64.1
28/06/2010	11.13.01	I	Tr.	I.	-2.6	71.3
28/06/2010	12.04.32	I	Sh.	E.	-12.7	68.6
28/06/2010	13.27.03	I	Tr.	E.	-27.1	56.9
28/06/2010	18.51.49	II	Sh.	I.	-40.7	-0.2
28/06/2010	21.41.23	II	Sh.	E.	-13.9	-21.3
28/06/2010	21.41.51	II	Tr.	I.	-13.8	-21.3
29/06/2010	0.26.36	II	Tr.	E.	16.7	-22.8
29/06/2010	7.09.34	I	Ec.	D.	38.0	36.2
29/06/2010	10.47.55	I	Occ.	R.	1.3	70.4
30/06/2010	4.17.30	I	Sh.	I.	47.2	5.4
30/06/2010	5.41.16	I	Tr.	I.	46.3	19.9
30/06/2010	6.32.57	I	Sh.	E.	41.9	29.3
30/06/2010	7.55.16	I	Tr.	E.	30.8	44.6
30/06/2010	13.00.28	II	Ec.	D.	-23.9	61.2
30/06/2010	18.33.39	II	Occ.	R.	-41.9	2.3

Date	Time	M	Phe	Pha	h	h S
01/07/2010	1.38.03	I	Ec.	D.	30.1	-17.1
01/07/2010	5.16.06	I	Occ.	R.	47.4	15.3
01/07/2010	7.40.44	III	Sh.	I.	32.5	41.8
01/07/2010	10.56.43	III	Sh.	E.	-1.3	70.7
01/07/2010	13.26.38	III	Tr.	I.	-28.8	56.9
01/07/2010	16.23.26	III	Tr.	E.	-47.9	24.7
01/07/2010	20.21.26	IV	Ec.	D.	-25.9	-13.5
01/07/2010	22.45.58	I	Sh.	I.	0.7	-24.6
01/07/2010	23.05.04	IV	Ec.	R.	4.0	-24.9
02/07/2010	0.09.31	I	Tr.	I.	15.7	-23.8
02/07/2010	1.01.25	I	Sh.	E.	24.8	-20.6
02/07/2010	2.23.28	I	Tr.	E.	37.4	-11.9
02/07/2010	8.09.44	II	Sh.	I.	27.4	47.1
02/07/2010	10.58.46	II	Tr.	I.	-2.6	70.7
02/07/2010	10.59.08	II	Sh.	E.	-2.7	70.7
02/07/2010	13.43.10	II	Tr.	E.	-32.0	54.1
02/07/2010	20.06.36	I	Ec.	D.	-27.7	-11.7
02/07/2010	23.44.18	I	Occ.	R.	11.8	-24.7
03/07/2010	17.14.24	I	Sh.	I.	-47.3	15.5
03/07/2010	18.37.39	I	Tr.	I.	-40.1	1.6
03/07/2010	19.29.50	I	Sh.	E.	-32.9	-6.7
03/07/2010	20.51.33	I	Tr.	E.	-19.4	-17.0
04/07/2010	2.18.17	II	Ec.	D.	37.7	-12.8
04/07/2010	7.50.18	II	Occ.	R.	29.3	43.3
04/07/2010	14.35.04	I	Ec.	D.	-40.2	44.7
04/07/2010	18.12.20	I	Occ.	R.	-42.6	5.6
04/07/2010	21.36.58	III	Ec.	D.	-10.6	-21.3
05/07/2010	0.52.56	III	Ec.	R.	25.2	-21.5
05/07/2010	3.19.09	III	Occ.	D.	44.8	-4.3
05/07/2010	6.15.29	III	Occ.	R.	41.9	25.7
05/07/2010	11.42.54	I	Sh.	I.	-13.3	70.0
05/07/2010	13.05.48	I	Tr.	I.	-27.8	60.2
05/07/2010	13.58.21	I	Sh.	E.	-35.8	51.3
05/07/2010	15.19.41	I	Tr.	E.	-45.1	36.4
05/07/2010	21.28.01	II	Sh.	I.	-11.5	-20.6
06/07/2010	0.15.24	II	Tr.	I.	19.4	-23.9
06/07/2010	0.17.12	II	Sh.	E.	19.7	-23.8
06/07/2010	2.59.25	I	Ec.	E.	43.4	-7.5
06/07/2010	9.03.35	I	Ec.	D.	15.5	56.2
06/07/2010	12.40.21	I	Occ.	R.	-24.1	64.0
07/07/2010	6.11.21	I	Sh.	I.	41.6	24.8
07/07/2010	7.33.48	I	Tr.	I.	30.2	40.0
07/07/2010	8.26.46	I	Sh.	E.	21.4	49.7
07/07/2010	9.47.39	I	Tr.	E.	6.9	63.1
07/07/2010	15.35.57	II	Ec.	D.	-46.7	33.4
07/07/2010	21.06.07	II	Occ.	R.	-14.1	-18.8
08/07/2010	3.32.04	I	Ec.	D.	46.6	-2.1
08/07/2010	7.08.16	I	Occ.	R.	33.6	35.2
08/07/2010	11.41.15	III	Sh.	I.	-15.0	69.8
08/07/2010	14.56.18	III	Sh.	E.	-44.0	40.7
08/07/2010	17.21.14	III	Tr.	I.	-45.7	14.1
08/07/2010	20.15.41	III	Tr.	E.	-22.4	-13.2
09/07/2010	0.39.50	I	Sh.	I.	25.6	-22.9
09/07/2010	2.01.48	I	Tr.	I.	38.1	-15.3
09/07/2010	2.55.15	I	Sh.	E.	44.1	-8.4
09/07/2010	4.15.37	I	Tr.	E.	48.0	4.3
09/07/2010	10.45.52	II	Sh.	I.	-5.5	69.3
09/07/2010	13.31.09	II	Tr.	I.	-34.0	55.9
09/07/2010	13.34.53	II	Sh.	E.	-34.6	55.2
09/07/2010	16.14.50	II	Tr.	E.	-48.0	26.1
09/07/2010	22.00.37	I	Ec.	D.	-1.9	-23.4
10/07/2010	1.36.11	I	Occ.	R.	35.1	-18.2
10/07/2010	5.16.36	IV	Sh.	I.	45.7	14.6
10/07/2010	7.46.54	IV	Sh.	E.	26.3	42.1
10/07/2010	19.08.16	I	Sh.	I.	-32.2	-9.6
10/07/2010	20.29.40	I	Tr.	I.	-18.6	-15.1
10/07/2010	21.23.41	I	Sh.	E.	-8.8	-20.7
10/07/2010	22.43.26	I	Tr.	E.	6.2	-25.4
11/07/2010	4.53.54	II	Ec.	D.	46.9	10.5
11/07/2010	10.21.49	II	Occ.	R.	-1.7	66.9
11/07/2010	16.29.04	I	Ec.	D.	-47.7	23.4
11/07/2010	20.03.58	I	Occ.	R.	-22.4	-12.0
12/07/2010	1.38.06	III	Ec.	D.	36.4	-18.3
12/07/2010	4.53.06	III	Ec.	R.	46.7	10.3
12/07/2010	7.11.47	III	Occ.	D.	30.8	35.4
12/07/2010	10.05.47	III	Occ.	R.	0.4	64.9
12/07/2010	13.36.47	I	Sh.	I.	-36.4	54.7
12/07/2010	14.57.33	I	Tr.	I.	-45.4	40.2
12/07/2010	15.52.12	I	Sh.	E.	-47.9	30.1
12/07/2010	17.11.17	I	Tr.	E.	-45.3	15.7
13/07/2010	0.04.03	II	Sh.	I.	22.1	-25.3
13/07/2010	2.46.34	II	Tr.	I.	44.7	-10.1
13/07/2010	2.52.50	II	Sh.	E.	45.2	-9.2
13/07/2010	5.29.53	II	Tr.	E.	43.6	16.6
13/07/2010	10.57.36	I	Ec.	D.	-10.5	69.4
13/07/2010	14.31.43	I	Occ.	R.	-43.4	44.9
14/07/2010	8.05.15	I	Sh.	I.	20.6	45.1

Date	Time	M	Phe	Pha	h	h S
14/07/2010	9.25.18	I	Tr.	I.	6.2	58.9
14/07/2010	10.20.39	I	Sh.	E.	-4.1	66.4
14/07/2010	11.38.59	I	Tr.	E.	-18.6	69.2
14/07/2010	18.11.38	II	Ec.	D.	-38.1	5.1
14/07/2010	23.36.36	II	Occ.	R.	18.6	-26.3
15/07/2010	5.26.04	I	Ec.	D.	43.3	15.7
15/07/2010	8.59.21	I	Occ.	R.	10.2	54.5
15/07/2010	15.42.00	III	Sh.	I.	-47.9	31.8
15/07/2010	18.56.05	III	Sh.	E.	-31.1	-1.7
15/07/2010	21.11.21	III	Tr.	I.	-7.5	-20.2
16/07/2010	0.03.32	III	Tr.	E.	24.0	-25.8
16/07/2010	2.33.45	I	Sh.	I.	44.6	-12.2
16/07/2010	3.53.01	I	Tr.	I.	48.1	0.1
16/07/2010	4.49.09	I	Sh.	E.	46.1	9.1
16/07/2010	6.06.41	I	Tr.	E.	38.1	23.0
16/07/2010	13.21.52	II	Sh.	I.	-36.5	56.8
16/07/2010	16.01.08	II	Tr.	I.	-47.8	28.2
16/07/2010	16.10.29	II	Sh.	E.	-47.7	26.4
16/07/2010	18.44.10	II	Tr.	E.	-32.3	0.0
16/07/2010	23.54.37	I	Ec.	D.	23.1	-26.2
17/07/2010	3.26.59	I	Occ.	R.	47.8	-4.6
17/07/2010	21.02.12	I	Sh.	I.	-7.8	-19.6
17/07/2010	22.20.36	I	Tr.	I.	7.0	-25.6
17/07/2010	23.17.36	I	Sh.	E.	17.3	-27.0
18/07/2010	0.34.15	I	Tr.	E.	30.3	-24.6
18/07/2010	7.29.41	II	Ec.	D.	24.1	38.1
18/07/2010	12.51.14	II	Occ.	R.	-33.1	61.3
18/07/2010	14.38.48	IV	Ec.	D.	-45.6	43.2
18/07/2010	17.08.34	IV	Ec.	R.	-43.5	15.6
18/07/2010	18.23.04	I	Ec.	D.	-34.3	2.9
18/07/2010	21.54.28	I	Occ.	R.	3.0	-24.2
19/07/2010	5.38.32	III	Ec.	D.	40.2	17.5
19/07/2010	8.52.33	III	Ec.	R.	8.6	52.8
19/07/2010	10.59.01	III	Occ.	D.	-14.9	68.4
19/07/2010	13.50.54	III	Occ.	R.	-41.6	51.6
19/07/2010	15.30.45	I	Sh.	I.	-47.9	33.5
19/07/2010	16.48.14	I	Tr.	I.	-45.0	19.2
19/07/2010	17.46.08	I	Sh.	E.	-38.9	8.9
19/07/2010	19.01.51	I	Tr.	E.	-27.7	-3.5
20/07/2010	2.39.59	II	Sh.	I.	46.3	-12.0
20/07/2010	5.15.20	II	Tr.	I.	42.4	13.2
20/07/2010	5.28.23	II	Sh.	E.	40.9	15.5
20/07/2010	7.58.02	II	Tr.	E.	17.8	43.0
20/07/2010	12.51.36	I	Ec.	D.	-34.3	61.0
20/07/2010	16.21.56	I	Occ.	R.	-46.5	23.9
21/07/2010	9.59.14	I	Sh.	I.	-5.3	62.7
21/07/2010	11.15.42	I	Tr.	I.	-19.3	68.4
21/07/2010	12.14.36	I	Sh.	E.	-29.2	65.4
21/07/2010	13.29.17	I	Tr.	E.	-39.9	55.0
21/07/2010	20.47.29	II	Ec.	D.	-7.7	-18.6
22/07/2010	2.04.55	II	Occ.	R.	44.1	-16.8
22/07/2010	7.20.04	I	Ec.	D.	23.1	35.8
22/07/2010	10.49.18	I	Occ.	R.	-15.3	67.4
22/07/2010	19.43.42	III	Sh.	I.	-18.5	-10.6
22/07/2010	22.56.48	III	Sh.	E.	17.1	-27.7
23/07/2010	0.57.30	III	Tr.	I.	36.7	-23.8
23/07/2010	3.47.40	III	Tr.	E.	47.7	-1.5
23/07/2010	4.27.45	I	Sh.	I.	45.7	4.6
23/07/2010	5.43.09	I	Tr.	I.	37.6	17.8
23/07/2010	6.43.07	I	Sh.	E.	28.6	28.8
23/07/2010	7.56.43	I	Tr.	E.	15.9	42.4
23/07/2010	15.57.46	II	Sh.	I.	-47.2	28.1
23/07/2010	18.28.43	II	Tr.	I.	-30.5	1.4
23/07/2010	18.46.00	II	Sh.	E.	-27.7	-1.1
23/07/2010	21.11.09	II	Tr.	E.	-1.0	-21.5
24/07/2010	1.48.37	I	Ec.	D.	43.3	-19.1
24/07/2010	5.16.40	I	Occ.	R.	40.5	12.9
24/07/2010	22.56.14	I	Sh.	I.	18.4	-28.1
25/07/2010	0.10.28	I	Tr.	I.	30.9	-27.2
25/07/2010	1.11.35	I	Sh.	E.	39.6	-23.0
25/07/2010	2.23.59	I	Tr.	E.	46.5	-15.0
25/07/2010	10.05.40	II	Ec.	D.	-9.5	62.8
25/07/2010	15.18.32	II	Occ.	R.	-47.9	35.1
25/07/2010	20.17.05	I	Ec.	D.	-10.4	-15.6
25/07/2010	23.43.53	I	Occ.	R.	27.2	-28.2
26/07/2010	9.38.54	III	Ec.	D.	-5.2	59.1
26/07/2010	12.51.56	III	Ec.	R.	-37.7	60.0
26/07/2010	14.41.21	III	Occ.	D.	-47.5	41.8
26/07/2010	17.24.48	I	Sh.	I.	-38.1	11.8
26/07/2010	17.31.25	III	Occ.	R.	-37.2	10.6
26/07/2010	18.37.49	I	Tr.	I.	-27.1	-0.3
26/07/2010	19.40.09	I	Sh.	E.	-16.4	-10.7
26/07/2010	20.51.18	I	Tr.	E.	-2.8	-19.9
26/07/2010	23.38.06	IV	Sh.	I.	26.9	-28.6
27/07/2010	1.52.01	IV	Sh.	E.	44.7	-19.3
27/07/2010	5.15.46	II	Sh.	I.	39.1	12.3
27/07/2010	7.41.39	II	Tr.	I.	15.8	39.1

Date	Time	M	Phe	Pha	h	h S
27/07/2010	8.03.46	II	Sh.	E.	11.8	43.1
27/07/2010	10.23.47	II	Tr.	E.	-14.2	64.4
27/07/2010	14.45.37	I	Ec.	D.	-47.7	40.9
27/07/2010	18.11.04	I	Occ.	R.	-30.8	3.6
28/07/2010	11.53.17	I	Sh.	I.	-30.3	65.8
28/07/2010	13.05.01	I	Tr.	I.	-40.4	57.7
28/07/2010	14.08.38	I	Sh.	E.	-46.3	47.3
28/07/2010	15.18.29	I	Tr.	E.	-47.8	34.7
28/07/2010	23.23.36	II	Ec.	D.	25.8	-29.2
29/07/2010	4.31.08	II	Occ.	R.	43.3	4.3
29/07/2010	9.14.06	I	Ec.	D.	-2.2	54.8
29/07/2010	12.38.08	I	Occ.	R.	-37.5	61.2
29/07/2010	23.44.46	III	Sh.	I.	29.9	-29.1
30/07/2010	2.56.52	III	Sh.	E.	48.0	-11.3
30/07/2010	4.38.01	III	Tr.	I.	42.1	5.3
30/07/2010	6.21.51	I	Sh.	I.	27.5	23.9
30/07/2010	7.26.27	III	Tr.	E.	16.4	35.9
30/07/2010	7.32.12	I	Tr.	I.	15.3	36.9
30/07/2010	8.37.10	I	Sh.	E.	3.5	48.6
30/07/2010	9.45.39	I	Tr.	E.	-9.5	59.3
30/07/2010	18.33.32	II	Sh.	I.	-25.2	-0.3
30/07/2010	20.53.50	II	Tr.	I.	0.6	-21.1
30/07/2010	21.21.21	II	Sh.	E.	5.5	-23.9
30/07/2010	23.35.44	II	Tr.	E.	29.1	-29.6
31/07/2010	3.42.39	I	Ec.	D.	46.5	-4.3
31/07/2010	7.05.13	I	Occ.	R.	19.4	31.8
01/08/2010	0.50.20	I	Sh.	I.	40.3	-26.3
01/08/2010	1.59.15	I	Tr.	I.	46.6	-19.4
01/08/2010	3.05.39	I	Sh.	E.	47.8	-10.4
01/08/2010	4.12.40	I	Tr.	E.	43.8	0.9
01/08/2010	12.41.54	II	Ec.	D.	-39.6	60.1
01/08/2010	17.43.42	II	Occ.	R.	-32.0	7.5
01/08/2010	22.11.08	I	Ec.	D.	15.9	-28.2
02/08/2010	1.32.10	I	Occ.	R.	45.0	-22.7
02/08/2010	13.39.34	III	Ec.	D.	-45.8	51.4
02/08/2010	16.51.39	III	Ec.	R.	-38.8	16.6
02/08/2010	18.19.10	III	Occ.	D.	-25.6	1.3
02/08/2010	19.18.56	I	Sh.	I.	-15.2	-8.9
02/08/2010	20.26.19	I	Tr.	I.	-2.1	-18.4
02/08/2010	21.07.43	III	Occ.	R.	5.1	-23.2
02/08/2010	21.34.15	I	Sh.	E.	10.0	-25.8
02/08/2010	22.39.43	I	Tr.	E.	21.7	-29.8
03/08/2010	7.51.28	II	Sh.	I.	8.9	39.9
03/08/2010	10.05.31	II	Tr.	I.	-16.1	61.0
03/08/2010	10.39.04	II	Sh.	E.	-22.0	64.1
03/08/2010	12.47.12	II	Tr.	E.	-41.2	59.0
03/08/2010	16.39.39	I	Ec.	D.	-39.9	18.6
03/08/2010	19.59.04	I	Occ.	R.	-7.1	-15.0
04/08/2010	8.57.39	IV	Ec.	D.	-4.2	51.2
04/08/2010	11.12.06	IV	Ec.	R.	-28.3	65.2
04/08/2010	13.47.27	I	Sh.	I.	-46.8	49.7
04/08/2010	14.53.14	I	Tr.	I.	-47.9	38.1
04/08/2010	16.02.45	I	Sh.	E.	-43.5	25.3
04/08/2010	17.06.37	I	Tr.	E.	-35.7	13.5
05/08/2010	1.59.53	II	Ec.	D.	47.3	-20.2
05/08/2010	6.55.10	II	Occ.	R.	17.5	29.2
05/08/2010	11.08.09	I	Ec.	D.	-28.3	64.8
05/08/2010	14.25.52	I	Occ.	R.	-48.1	42.8
06/08/2010	3.46.13	III	Sh.	I.	44.3	-4.8
06/08/2010	6.57.15	III	Sh.	E.	16.4	29.4
06/08/2010	8.13.50	III	Tr.	I.	2.6	43.4
06/08/2010	8.16.02	I	Sh.	I.	2.2	43.7
06/08/2010	9.20.10	I	Tr.	I.	-10.1	54.3
06/08/2010	10.31.20	I	Sh.	E.	-22.8	62.8
06/08/2010	11.00.52	III	Tr.	E.	-27.8	64.4
06/08/2010	11.33.32	I	Tr.	E.	-33.0	64.4
06/08/2010	21.09.14	II	Sh.	I.	8.3	-24.4
06/08/2010	23.16.34	II	Tr.	I.	30.5	-31.5
06/08/2010	23.56.40	II	Sh.	E.	36.4	-30.8
07/08/2010	1.58.04	II	Tr.	E.	47.5	-20.9
07/08/2010	5.36.42	I	Ec.	D.	29.5	14.4
07/08/2010	8.52.40	I	Occ.	R.	-5.8	49.8
08/08/2010	2.44.33	I	Sh.	I.	47.5	-14.9
08/08/2010	3.46.56	I	Tr.	I.	43.4	-5.1
08/08/2010	4.59.50	I	Sh.	E.	34.5	7.6
08/08/2010	6.00.18	I	Tr.	E.	24.9	18.6
08/08/2010	15.18.20	II	Ec.	D.	-46.0	32.7
08/08/2010	20.06.41	II	Occ.	R.	-1.2	-17.3
09/08/2010	0.05.12	I	Ec.	D.	38.6	-31.1
09/08/2010	3.19.21	I	Occ.	R.	45.4	-9.8
09/08/2010	17.40.24	III	Ec.	D.	-27.4	6.5
09/08/2010	20.51.28	III	Ec.	R.	7.3	-23.2
09/08/2010	21.13.11	I	Sh.	I.	11.2	-25.6
09/08/2010	21.52.10	III	Occ.	D.	18.3	-29.1
09/08/2010	22.13.45	I	Tr.	I.	22.0	-30.5
09/08/2010	23.28.27	I	Sh.	E.	34.1	-32.3
10/08/2010	0.27.06	I	Tr.	E.	41.7	-30.2

Date	Time	M	Phe	Pha	h	h S
10/08/2010	0.39.34	III	Occ.	R.	43.0	-29.4
10/08/2010	10.27.06	II	Sh.	I.	-25.0	61.4
10/08/2010	12.27.04	II	Tr.	I.	-42.3	59.6
10/08/2010	13.14.19	II	Sh.	E.	-46.4	53.5
10/08/2010	15.08.22	II	Tr.	E.	-46.1	34.1
10/08/2010	18.33.44	I	Ec.	D.	-17.6	-2.8
10/08/2010	21.46.00	I	Occ.	R.	17.9	-28.9
11/08/2010	15.41.43	I	Sh.	I.	-42.9	27.8
11/08/2010	16.40.25	I	Tr.	I.	-35.5	16.9
11/08/2010	17.56.59	I	Sh.	E.	-23.3	3.1
11/08/2010	18.53.44	I	Tr.	E.	-13.2	-6.9
12/08/2010	4.36.24	II	Ec.	D.	35.4	2.9
12/08/2010	9.17.07	II	Occ.	R.	-14.2	52.6
12/08/2010	13.02.14	I	Ec.	D.	-46.2	54.7
12/08/2010	16.12.33	I	Occ.	R.	-38.8	21.8
12/08/2010	18.01.41	IV	Sh.	I.	-21.8	2.1
12/08/2010	19.56.33	IV	Sh.	E.	-0.2	-16.9
13/08/2010	7.47.05	III	Sh.	I.	2.1	37.4
13/08/2010	10.10.20	I	Sh.	I.	-24.3	59.1
13/08/2010	10.57.04	III	Sh.	E.	-32.0	62.3
13/08/2010	11.07.05	I	Tr.	I.	-33.5	62.5
13/08/2010	11.44.18	III	Tr.	I.	-38.7	62.0
13/08/2010	12.25.36	I	Sh.	E.	-43.5	58.9
13/08/2010	13.20.24	I	Tr.	E.	-47.5	51.8
13/08/2010	14.30.21	III	Tr.	E.	-47.6	40.3
13/08/2010	23.44.50	II	Sh.	I.	38.5	-33.2
14/08/2010	1.36.56	II	Tr.	I.	47.5	-25.0
14/08/2010	2.31.52	II	Sh.	E.	46.9	-18.0
14/08/2010	4.18.08	II	Tr.	E.	36.7	-0.3
14/08/2010	7.30.49	I	Ec.	D.	4.2	34.3
14/08/2010	10.39.06	I	Occ.	R.	-29.8	61.2
15/08/2010	4.38.53	I	Sh.	I.	33.1	2.8
15/08/2010	5.33.36	I	Tr.	I.	24.3	12.6
15/08/2010	6.54.07	I	Sh.	E.	10.1	27.4
15/08/2010	7.46.55	I	Tr.	E.	0.7	37.0
15/08/2010	17.55.02	II	Ec.	D.	-20.8	2.6
15/08/2010	22.27.42	II	Occ.	R.	28.4	-33.1
16/08/2010	1.59.19	I	Ec.	D.	47.5	-22.8
16/08/2010	5.05.32	I	Occ.	R.	28.3	7.3
16/08/2010	21.42.08	III	Ec.	D.	21.5	-30.4
16/08/2010	23.07.32	I	Sh.	I.	35.1	-34.5
17/08/2010	0.00.10	I	Tr.	I.	41.8	-33.6
17/08/2010	0.52.12	III	Ec.	R.	46.1	-30.3
17/08/2010	1.21.21	III	Occ.	D.	47.3	-27.5
17/08/2010	1.22.46	I	Sh.	E.	47.4	-27.4
17/08/2010	2.13.29	I	Tr.	E.	47.0	-21.2
17/08/2010	4.08.01	III	Occ.	R.	36.3	-2.8
17/08/2010	13.02.38	II	Sh.	I.	-47.6	53.2
17/08/2010	14.46.20	II	Tr.	I.	-45.8	36.5
17/08/2010	15.49.28	II	Sh.	E.	-39.2	24.9
17/08/2010	17.27.23	II	Tr.	E.	-24.2	6.9
17/08/2010	20.27.52	I	Ec.	D.	8.9	-22.6
17/08/2010	23.31.57	I	Occ.	R.	38.9	-34.7
18/08/2010	17.36.06	I	Sh.	I.	-22.0	5.1
18/08/2010	18.26.36	I	Tr.	I.	-13.0	-3.8
18/08/2010	19.51.20	I	Sh.	E.	3.0	-17.8
18/08/2010	20.39.54	I	Tr.	E.	11.8	-24.5
19/08/2010	7.13.11	II	Ec.	D.	3.5	30.3
19/08/2010	11.37.08	II	Occ.	R.	-41.2	60.4
19/08/2010	14.56.23	I	Ec.	D.	-44.3	34.1
19/08/2010	17.58.16	I	Occ.	R.	-17.4	1.1
20/08/2010	11.47.56	III	Sh.	I.	-42.9	59.6
20/08/2010	12.04.45	I	Sh.	I.	-44.6	58.5
20/08/2010	12.53.02	I	Tr.	I.	-47.8	53.6
20/08/2010	14.19.59	I	Sh.	E.	-46.9	40.3
20/08/2010	14.56.53	III	Sh.	E.	-43.9	33.8
20/08/2010	15.06.20	I	Tr.	E.	-42.9	32.1
20/08/2010	15.10.14	III	Tr.	I.	-42.5	31.4
20/08/2010	17.55.45	III	Tr.	E.	-17.1	1.3
21/08/2010	2.20.23	II	Sh.	I.	45.6	-21.2
21/08/2010	3.17.49	IV	Ec.	D.	40.4	-12.5
21/08/2010	3.55.12	II	Tr.	I.	35.6	-6.2
21/08/2010	5.07.01	II	Sh.	E.	24.4	6.7
21/08/2010	5.14.40	IV	Ec.	R.	23.1	8.1
21/08/2010	6.36.10	II	Tr.	E.	8.6	23.1
21/08/2010	9.24.58	I	Ec.	D.	-22.5	51.7
21/08/2010	12.24.35	I	Occ.	R.	-46.6	56.5
22/08/2010	6.33.20	I	Sh.	I.	8.3	22.4
22/08/2010	7.19.20	I	Tr.	I.	0.2	30.8
22/08/2010	8.48.33	I	Sh.	E.	-16.8	46.1
22/08/2010	9.32.39	I	Tr.	E.	-24.6	52.4
22/08/2010	20.31.57	II	Ec.	D.	13.4	-24.7
23/08/2010	0.46.51	II	Occ.	R.	46.8	-32.5
23/08/2010	3.53.30	I	Ec.	D.	34.6	-6.9
23/08/2010	6.50.48	I	Occ.	R.	4.3	25.5
24/08/2010	1.02.01	I	Sh.	I.	47.3	-31.4
24/08/2010	1.43.21	III	Ec.	D.	46.8	-26.8



Date	Time	M	Phe	Pha	h	h S
24/08/2010	1.45.42	I	Tr.	I.	46.7	-26.5
24/08/2010	3.17.13	I	Sh.	E.	38.8	-13.2
24/08/2010	3.59.00	I	Tr.	E.	33.1	-6.2
24/08/2010	7.32.03	III	Occ.	R.	-4.2	32.8
24/08/2010	15.38.10	II	Sh.	I.	-36.9	25.2
24/08/2010	17.03.38	II	Tr.	I.	-23.4	9.4
24/08/2010	18.24.37	II	Sh.	E.	-8.8	-5.4
24/08/2010	19.44.33	II	Tr.	E.	6.3	-18.6
24/08/2010	22.22.04	I	Ec.	D.	33.2	-35.8
25/08/2010	1.17.01	I	Occ.	R.	47.2	-30.1
25/08/2010	19.30.38	I	Sh.	I.	4.5	-16.7
25/08/2010	20.11.55	I	Tr.	I.	12.0	-22.9
25/08/2010	21.45.49	I	Sh.	E.	28.2	-33.7
25/08/2010	22.25.14	I	Tr.	E.	34.3	-36.3
26/08/2010	9.50.11	II	Ec.	D.	-30.5	53.5
26/08/2010	13.55.27	II	Occ.	R.	-47.0	42.6
26/08/2010	16.50.36	I	Ec.	D.	-24.2	11.2
26/08/2010	19.43.08	I	Occ.	R.	7.5	-19.0
27/08/2010	13.59.19	I	Sh.	I.	-46.5	41.7
27/08/2010	14.38.10	I	Tr.	I.	-43.0	35.1
27/08/2010	15.49.10	III	Sh.	I.	-33.5	22.3
27/08/2010	16.14.30	I	Sh.	E.	-29.6	17.6
27/08/2010	16.51.28	I	Tr.	E.	-23.3	10.8
27/08/2010	18.32.32	III	Tr.	I.	-5.0	-7.7
27/08/2010	18.57.05	III	Sh.	E.	0.1	-11.9
27/08/2010	21.18.01	III	Tr.	E.	25.0	-31.8
28/08/2010	4.55.53	II	Sh.	I.	21.0	3.5
28/08/2010	6.11.36	II	Tr.	I.	7.4	17.3
28/08/2010	7.42.09	II	Sh.	E.	-9.6	33.8
28/08/2010	8.52.29	II	Tr.	E.	-22.3	45.3
28/08/2010	11.19.12	I	Ec.	D.	-43.8	57.6
28/08/2010	14.09.16	I	Occ.	R.	-45.4	39.7
29/08/2010	8.27.55	I	Sh.	I.	-18.7	41.3
29/08/2010	9.04.16	I	Tr.	I.	-25.1	46.8
29/08/2010	10.43.05	I	Sh.	E.	-40.1	56.7
29/08/2010	11.17.36	I	Tr.	E.	-44.1	57.3
29/08/2010	12.28.02	IV	Sh.	I.	-48.7	53.4
29/08/2010	13.59.52	IV	Sh.	E.	-45.9	40.9
29/08/2010	23.09.08	II	Ec.	D.	41.8	-38.9
30/08/2010	3.04.25	II	Occ.	R.	36.9	-16.6
30/08/2010	5.47.45	I	Ec.	D.	10.1	12.6
30/08/2010	8.35.19	I	Occ.	R.	-20.8	42.2
31/08/2010	2.56.39	I	Sh.	I.	37.3	-18.1
31/08/2010	3.30.27	I	Tr.	I.	32.6	-12.5
31/08/2010	5.11.48	I	Sh.	E.	15.8	5.8
31/08/2010	5.43.48	I	Tr.	E.	10.0	11.7
31/08/2010	5.44.55	III	Ec.	D.	9.8	11.9
31/08/2010	10.53.04	III	Occ.	R.	-42.5	56.3
31/08/2010	18.13.38	II	Sh.	I.	-5.4	-5.5
31/08/2010	19.19.11	II	Tr.	I.	6.9	-16.8
31/08/2010	20.59.42	II	Sh.	E.	24.7	-31.2
31/08/2010	22.00.05	II	Tr.	E.	34.1	-37.0
01/09/2010	0.16.20	I	Ec.	D.	46.7	-37.5
01/09/2010	3.01.21	I	Occ.	R.	36.1	-17.5
01/09/2010	21.25.17	I	Sh.	I.	29.5	-34.3
01/09/2010	21.56.31	I	Tr.	I.	34.2	-37.1
01/09/2010	23.40.26	I	Sh.	E.	45.3	-39.6
02/09/2010	0.09.52	I	Tr.	E.	46.6	-38.3
02/09/2010	12.27.29	II	Ec.	D.	-49.1	52.0
02/09/2010	16.12.22	II	Occ.	R.	-25.8	16.3
02/09/2010	18.44.54	I	Ec.	D.	2.3	-11.7
02/09/2010	21.27.19	I	Occ.	R.	30.5	-34.9
03/09/2010	15.54.01	I	Sh.	I.	-28.2	19.3
03/09/2010	16.22.36	I	Tr.	I.	-23.3	14.1
03/09/2010	18.09.09	I	Sh.	E.	-3.7	-5.7
03/09/2010	18.35.58	I	Tr.	E.	1.5	-10.5
03/09/2010	19.50.42	III	Sh.	I.	14.9	-22.8
03/09/2010	21.51.36	III	Tr.	I.	34.7	-37.4
03/09/2010	22.57.33	III	Sh.	E.	42.5	-40.6
04/09/2010	0.37.31	III	Tr.	E.	46.7	-36.9
04/09/2010	7.31.21	II	Sh.	I.	-13.4	30.5
04/09/2010	8.26.25	II	Tr.	I.	-23.3	39.7
04/09/2010	10.17.14	II	Sh.	E.	-40.4	53.2
04/09/2010	11.07.21	II	Tr.	E.	-45.8	55.1
04/09/2010	13.13.31	I	Ec.	D.	-47.6	45.8
04/09/2010	15.53.18	I	Occ.	R.	-27.6	19.2
05/09/2010	10.22.39	I	Sh.	I.	-41.7	53.2
05/09/2010	10.48.34	I	Tr.	I.	-44.5	54.4
05/09/2010	12.37.46	I	Sh.	E.	-49.0	49.8
05/09/2010	13.01.58	I	Tr.	E.	-48.1	47.0
06/09/2010	1.46.32	II	Ec.	D.	42.1	-29.9
06/09/2010	5.20.44	II	Occ.	R.	9.3	6.4
06/09/2010	7.42.05	I	Ec.	D.	-17.0	31.9
06/09/2010	10.19.13	I	Occ.	R.	-41.8	52.6
06/09/2010	21.40.12	IV	Ec.	D.	34.8	-37.6
06/09/2010	23.15.48	IV	Ec.	R.	44.9	-41.8
07/09/2010	4.51.25	I	Sh.	I.	13.7	1.0

Date	Time	M	Phe	Pha	h	h S
07/09/2010	5.14.38	I	Tr.	I.	9.5	5.1
07/09/2010	7.06.31	I	Sh.	E.	-11.4	25.5
07/09/2010	7.28.02	I	Tr.	E.	-15.3	29.3
07/09/2010	9.45.53	III	Ec.	D.	-38.1	49.5
07/09/2010	14.10.58	III	Occ.	R.	-41.0	36.2
07/09/2010	20.49.06	II	Sh.	I.	27.7	-32.4
07/09/2010	21.33.23	II	Tr.	I.	34.4	-37.4
07/09/2010	23.34.48	II	Sh.	E.	46.0	-41.9
08/09/2010	0.14.23	II	Tr.	E.	46.6	-40.0
08/09/2010	2.10.42	I	Ec.	D.	38.4	-27.0
08/09/2010	4.45.08	I	Occ.	R.	14.0	-0.1
08/09/2010	23.20.06	I	Sh.	I.	45.5	-42.5
08/09/2010	23.40.34	I	Tr.	I.	46.3	-42.1
09/09/2010	1.35.11	I	Sh.	E.	41.8	-32.2
09/09/2010	1.54.00	I	Tr.	E.	39.8	-29.7
09/09/2010	15.04.59	II	Ec.	D.	-32.1	26.3
09/09/2010	18.28.11	II	Occ.	R.	4.5	-11.0
09/09/2010	20.39.17	I	Ec.	D.	27.5	-31.9
09/09/2010	23.11.00	I	Occ.	R.	45.2	-42.9
10/09/2010	17.48.51	I	Sh.	I.	-1.5	-4.0
10/09/2010	18.06.33	I	Tr.	I.	1.5	-7.5
10/09/2010	20.03.56	I	Sh.	E.	22.3	-27.2
10/09/2010	20.20.01	I	Tr.	E.	25.0	-29.6
10/09/2010	23.53.16	III	Sh.	I.	46.5	-42.3
11/09/2010	1.08.59	III	Tr.	I.	43.3	-36.0
11/09/2010	2.59.03	III	Sh.	E.	29.7	-20.1
11/09/2010	3.55.49	III	Tr.	E.	20.3	-10.3
11/09/2010	10.06.51	II	Sh.	I.	-43.2	50.1
11/09/2010	10.40.07	II	Tr.	I.	-46.5	52.0
11/09/2010	12.52.22	II	Sh.	E.	-47.4	45.9
11/09/2010	13.21.12	II	Tr.	E.	-44.9	42.3
11/09/2010	15.07.55	I	Ec.	D.	-30.3	25.1
11/09/2010	17.36.53	I	Occ.	R.	-3.4	-1.6
12/09/2010	12.17.32	I	Sh.	I.	-49.1	49.1
12/09/2010	12.32.26	I	Tr.	I.	-48.4	47.7
12/09/2010	14.32.36	I	Sh.	E.	-35.2	30.9
12/09/2010	14.45.56	I	Tr.	E.	-33.2	28.6
13/09/2010	4.24.11	II	Ec.	D.	13.7	-5.6
13/09/2010	7.36.12	II	Occ.	R.	-21.7	29.4
13/09/2010	9.36.31	I	Ec.	D.	-40.7	46.7
13/09/2010	12.02.45	I	Occ.	R.	-49.4	49.8
14/09/2010	6.46.20	I	Sh.	I.	-13.6	20.5
14/09/2010	6.58.26	I	Tr.	I.	-15.8	22.7
14/09/2010	9.01.23	I	Sh.	E.	-36.5	42.2
14/09/2010	9.11.56	I	Tr.	E.	-38.0	43.5
14/09/2010	13.46.52	III	Ec.	D.	-40.5	37.5
14/09/2010	17.27.11	III	Occ.	R.	-2.6	-0.7
14/09/2010	23.24.34	II	Sh.	I.	46.2	-44.7
14/09/2010	23.46.39	II	Tr.	I.	46.2	-44.0
15/09/2010	2.09.54	II	Sh.	E.	34.1	-28.9
15/09/2010	2.27.51	II	Tr.	E.	31.5	-26.1
15/09/2010	4.05.09	I	Ec.	D.	15.4	-9.5
15/09/2010	6.28.36	I	Occ.	R.	-11.2	17.1
15/09/2010	6.58.54	IV	Sh.	I.	-16.7	22.5
15/09/2010	7.59.12	IV	Sh.	E.	-27.3	32.8
16/09/2010	1.15.03	I	Sh.	I.	40.4	-36.7
16/09/2010	1.24.19	I	Tr.	I.	39.3	-35.6
16/09/2010	3.30.06	I	Sh.	E.	20.7	-15.9
16/09/2010	3.37.51	I	Tr.	E.	19.4	-14.5
16/09/2010	17.42.45	II	Ec.	D.	1.7	-5.0
16/09/2010	20.43.26	II	Occ.	R.	32.5	-35.0
16/09/2010	22.33.45	I	Ec.	D.	44.5	-45.0
17/09/2010	0.54.25	I	Occ.	R.	41.9	-39.4
17/09/2010	19.43.51	I	Sh.	I.	23.8	-26.6
17/09/2010	19.50.16	I	Tr.	I.	24.9	-27.6
17/09/2010	21.58.53	I	Sh.	E.	42.1	-43.4
17/09/2010	22.03.50	I	Tr.	E.	42.6	-43.8
18/09/2010	3.55.15	III	Sh.	I.	14.7	-11.9
18/09/2010	4.24.03	III	Tr.	I.	9.5	-6.6
18/09/2010	6.59.55	III	Sh.	E.	-19.4	22.1
18/09/2010	7.12.13	III	Tr.	E.	-21.6	24.2
18/09/2010	12.42.20	II	Sh.	I.	-46.0	44.4
18/09/2010	12.53.07	II	Tr.	I.	-44.9	43.2
18/09/2010	15.27.29	II	Sh.	E.	-22.0	19.3
18/09/2010	15.34.28	II	Tr.	E.	-20.7	18.1
18/09/2010	17.02.26	I	Ec.	D.	-4.5	2.1
18/09/2010	19.20.17	I	Occ.	R.	20.6	-23.0
19/09/2010	14.12.34	I	Sh.	I.	-33.8	31.7
19/09/2010	14.16.07	I	Tr.	I.	-33.3	31.2
19/09/2010	16.27.35	I	Sh.	E.	-10.3	8.1
19/09/2010	16.29.44	I	Tr.	E.	-9.9	7.7
20/09/2010	7.02.06	II	Ec.	D.	-21.4	22.0
20/09/2010	9.51.22	II	Occ.	R.	-46.1	45.8
20/09/2010	11.31.04	I	Ec.	D.	-49.8	48.6
20/09/2010	13.46.08	I	Occ.	R.	-37.2	35.4
21/09/2010	8.41.24	I	Sh.	I.	-38.3	37.6
21/09/2010	8.42.06	I	Tr.	I.	-38.4	37.7

Date	Time	M	Phe	Pha	h	h S
21/09/2010	10.55.44	I	Tr.	E.	-50.0	48.6
21/09/2010	10.56.24	I	Sh.	E.	-50.0	48.6
21/09/2010	17.48.17	III	Ec.	D.	6.4	-7.7
21/09/2010	20.53.00	III	Ec.	R.	36.6	-38.2
22/09/2010	1.59.31	II	Tr.	I.	30.9	-32.2
22/09/2010	2.00.03	II	Sh.	I.	30.8	-32.2
22/09/2010	4.41.01	II	Tr.	E.	3.2	-4.1
22/09/2010	4.45.02	II	Sh.	E.	2.4	-3.1
22/09/2010	5.58.59	I	Occ.	D.	-11.6	10.3
22/09/2010	8.14.00	I	Ec.	R.	-35.0	33.4
23/09/2010	3.07.59	I	Tr.	I.	19.0	-21.3
23/09/2010	3.10.09	I	Sh.	I.	18.6	-20.9
23/09/2010	5.21.40	I	Tr.	E.	-5.5	3.4
23/09/2010	5.25.08	I	Sh.	E.	-6.2	4.0
23/09/2010	16.07.08	IV	Ec.	D.	-11.0	10.5
23/09/2010	17.15.09	IV	Ec.	R.	2.0	-1.4
23/09/2010	20.14.25	II	Occ.	D.	32.5	-33.5
23/09/2010	23.08.21	II	Ec.	R.	45.7	-48.3
24/09/2010	0.24.47	I	Occ.	D.	41.5	-44.6
24/09/2010	2.42.37	I	Ec.	R.	22.5	-25.8
24/09/2010	21.33.58	I	Tr.	I.	42.3	-44.0
24/09/2010	21.39.00	I	Sh.	I.	42.7	-44.5
24/09/2010	23.47.42	I	Tr.	E.	44.0	-47.6
24/09/2010	23.53.58	I	Sh.	E.	43.6	-47.2
25/09/2010	7.38.54	III	Tr.	I.	-31.7	27.1
25/09/2010	7.57.37	III	Sh.	I.	-34.6	30.1
25/09/2010	10.28.43	III	Tr.	E.	-50.0	46.4
25/09/2010	11.01.08	III	Sh.	E.	-50.3	47.1
25/09/2010	15.06.00	II	Tr.	I.	-20.6	20.8
25/09/2010	15.17.52	II	Sh.	I.	-18.4	18.7
25/09/2010	17.47.41	II	Tr.	E.	9.4	-8.9
25/09/2010	18.02.40	II	Sh.	E.	12.1	-11.7
25/09/2010	18.50.40	I	Occ.	D.	20.5	-20.3
25/09/2010	21.11.16	I	Ec.	R.	40.6	-41.9
26/09/2010	15.59.52	I	Tr.	I.	-10.0	10.9
26/09/2010	16.07.45	I	Sh.	I.	-8.5	9.4
26/09/2010	18.13.38	I	Tr.	E.	14.8	-14.0
26/09/2010	18.22.41	I	Sh.	E.	16.4	-15.7
27/09/2010	9.22.14	II	Occ.	D.	-46.6	40.8
27/09/2010	12.27.44	II	Ec.	R.	-43.8	42.3
27/09/2010	13.16.31	I	Occ.	D.	-37.3	36.9
27/09/2010	15.39.54	I	Ec.	R.	-12.9	14.1
28/09/2010	10.25.54	I	Tr.	I.	-50.4	45.2
28/09/2010	10.36.37	I	Sh.	I.	-50.5	45.6
28/09/2010	12.39.42	I	Tr.	E.	-41.8	40.8
28/09/2010	12.51.33	I	Sh.	E.	-40.3	39.5
28/09/2010	21.07.47	III	Occ.	D.	41.3	-42.7
29/09/2010	0.53.31	III	Ec.	R.	35.5	-43.2
29/09/2010	4.12.31	II	Tr.	I.	2.5	-10.9
29/09/2010	4.35.36	II	Sh.	I.	-1.3	-6.6
29/09/2010	6.54.22	II	Tr.	E.	-27.3	18.7
29/09/2010	7.20.14	II	Sh.	E.	-31.6	23.1
29/09/2010	7.42.24	I	Occ.	D.	-35.2	26.7
29/09/2010	10.08.33	I	Ec.	R.	-50.2	43.9
30/09/2010	4.51.52	I	Tr.	I.	-6.0	-3.5
30/09/2010	5.05.25	I	Sh.	I.	-8.6	-0.6
30/09/2010	7.05.42	I	Tr.	E.	-30.0	20.4
30/09/2010	7.20.20	I	Sh.	E.	-32.4	22.9
30/09/2010	22.29.25	II	Occ.	D.	45.4	-50.4
01/10/2010	1.46.21	II	Ec.	R.	26.4	-36.5
01/10/2010	2.08.18	I	Occ.	D.	22.8	-33.1
01/10/2010	4.37.11	I	Ec.	R.	-3.9	-6.7
01/10/2010	23.17.56	I	Tr.	I.	43.6	-51.3
01/10/2010	23.34.17	I	Sh.	I.	42.4	-50.8
02/10/2010	1.31.50	I	Tr.	E.	27.9	-39.0
02/10/2010	1.49.12	I	Sh.	E.	25.2	-36.4
02/10/2010	10.53.43	III	Tr.	I.	-49.9	44.4
02/10/2010	11.59.29	III	Sh.	I.	-44.7	42.5
02/10/2010	13.45.28	III	Tr.	E.	-29.4	31.1
02/10/2010	15.01.52	III	Sh.	E.	-16.0	19.1
02/10/2010	17.19.13	II	Tr.	I.	9.6	-5.9
02/10/2010	17.53.24	II	Sh.	I.	15.7	-12.2
02/10/2010	20.01.17	II	Tr.	E.	35.7	-34.7
02/10/2010	20.34.15	I	Occ.	D.	39.6	-39.7
02/10/2010	20.37.52	II	Sh.	E.	40.0	-40.2
02/10/2010	23.05.52	I	Ec.	R.	44.0	-51.8
03/10/2010	17.43.56	I	Tr.	I.	14.8	-10.8
03/10/2010	18.03.04	I	Sh.	I.	18.1	-14.3
03/10/2010	19.57.52	I	Tr.	E.	35.8	-34.5
03/10/2010	20.17.58	I	Sh.	E.	38.2	-37.6
04/10/2010	11.37.39	II	Occ.	D.	-46.2	42.9
04/10/2010	15.00.13	I	Occ.	D.	-14.7	18.7
04/10/2010	15.05.52	II	Ec.	R.	-13.7	17.7
04/10/2010	17.34.33	I	Ec.	R.	13.8	-9.4
05/10/2010	12.10.05	I	Tr.	I.	-42.0	40.6
05/10/2010	12.31.59	I	Sh.	I.	-39.0	38.8
05/10/2010	14.24.04	I	Tr.	E.	-20.5	24.3

Date	Time	M	Phe	Pha	h	h S
05/10/2010	14.46.51	I	Sh.	E.	-16.4	20.6
06/10/2010	0.24.14	III	Occ.	D.	35.0	-48.6
06/10/2010	4.55.00	III	Ec.	R.	-11.7	-4.3
06/10/2010	6.26.05	II	Tr.	I.	-28.0	12.3
06/10/2010	7.11.10	II	Sh.	I.	-35.4	20.0
06/10/2010	9.08.22	II	Tr.	E.	-49.1	36.4
06/10/2010	9.26.13	I	Occ.	D.	-50.1	38.2
06/10/2010	9.55.29	II	Sh.	E.	-50.9	40.6
06/10/2010	12.03.13	I	Ec.	R.	-42.3	40.7
07/10/2010	6.36.11	I	Tr.	I.	-30.5	13.8
07/10/2010	7.00.49	I	Sh.	I.	-34.5	18.0
07/10/2010	8.50.12	I	Tr.	E.	-48.1	34.1
07/10/2010	9.15.40	I	Sh.	E.	-49.8	36.9
08/10/2010	0.45.17	II	Occ.	D.	30.8	-46.9
08/10/2010	3.52.14	I	Occ.	D.	-0.9	-16.5
08/10/2010	4.24.32	II	Ec.	R.	-7.7	-10.5
08/10/2010	6.31.53	I	Ec.	R.	-30.5	12.8
09/10/2010	1.02.24	I	Tr.	I.	27.5	-45.0
09/10/2010	1.29.44	I	Sh.	I.	23.1	-41.1
09/10/2010	3.16.29	I	Tr.	E.	4.3	-23.2
09/10/2010	3.44.34	I	Sh.	E.	-0.4	-18.1
09/10/2010	14.10.06	III	Tr.	I.	-20.0	25.1
09/10/2010	16.01.23	III	Sh.	I.	1.0	6.5
09/10/2010	17.03.55	III	Tr.	E.	12.1	-5.1
09/10/2010	19.02.38	III	Sh.	E.	31.7	-27.0
09/10/2010	19.33.17	II	Tr.	I.	35.8	-32.4
09/10/2010	20.29.01	II	Sh.	I.	41.7	-41.4
09/10/2010	22.15.48	II	Tr.	E.	44.5	-53.2
09/10/2010	22.18.21	I	Occ.	D.	44.4	-53.4
09/10/2010	23.13.09	II	Sh.	E.	40.8	-54.4
10/10/2010	1.00.36	I	Ec.	R.	27.0	-45.5
10/10/2010	10.50.15	IV	Ec.	D.	-48.3	41.3
10/10/2010	19.28.34	I	Tr.	I.	35.7	-31.9
10/10/2010	19.58.33	I	Sh.	I.	39.2	-36.9
10/10/2010	21.42.41	I	Tr.	E.	44.9	-51.0
10/10/2010	22.13.22	I	Sh.	E.	44.4	-53.5
11/10/2010	13.54.06	II	Occ.	D.	-21.4	26.7
11/10/2010	16.44.29	I	Occ.	D.	10.1	-1.4
11/10/2010	17.44.08	II	Ec.	R.	20.6	-13.3
11/10/2010	19.29.18	I	Ec.	R.	36.3	-32.3
12/10/2010	13.54.53	I	Tr.	I.	-20.5	26.3
12/10/2010	14.27.29	I	Sh.	I.	-14.6	21.4
12/10/2010	16.09.03	I	Tr.	E.	4.5	4.2
12/10/2010	16.42.17	I	Sh.	E.	10.5	-1.3
13/10/2010	3.42.13	III	Occ.	D.	-3.8	-19.3
13/10/2010	8.40.48	II	Tr.	I.	-49.6	31.2
13/10/2010	8.55.55	III	Ec.	R.	-50.4	32.9
13/10/2010	9.46.50	II	Sh.	I.	-51.0	37.6
13/10/2010	11.10.40	I	Occ.	D.	-45.2	40.1
13/10/2010	11.23.32	II	Tr.	E.	-43.7	39.9
13/10/2010	12.30.50	II	Sh.	E.	-34.2	35.9
13/10/2010	13.58.00	I	Ec.	R.	-19.2	25.5
14/10/2010	8.21.11	I	Tr.	I.	-48.5	28.4
14/10/2010	8.56.21	I	Sh.	I.	-50.6	32.7
14/10/2010	10.35.24	I	Tr.	E.	-48.3	39.6
14/10/2010	11.11.07	I	Sh.	E.	-44.7	39.7
15/10/2010	3.02.27	II	Occ.	D.	2.0	-27.0
15/10/2010	5.36.53	I	Occ.	D.	-26.6	1.8
15/10/2010	7.02.53	II	Ec.	R.	-40.2	16.5
15/10/2010	8.26.42	I	Ec.	R.	-49.3	28.8
16/10/2010	2.47.37	I	Tr.	I.	3.9	-29.9
16/10/2010	3.25.18	I	Sh.	I.	-2.9	-23.0
16/10/2010	5.01.53	I	Tr.	E.	-21.2	-5.1
16/10/2010	5.40.03	I	Sh.	E.	-27.9	2.1
16/10/2010	17.29.25	III	Tr.	I.	21.6	-12.0
16/10/2010	20.03.43	III	Sh.	I.	41.8	-39.7
16/10/2010	20.25.24	III	Tr.	E.	43.3	-43.1
16/10/2010	21.48.42	II	Tr.	I.	44.1	-53.8
16/10/2010	23.03.51	III	Sh.	E.	38.5	-57.1
16/10/2010	23.04.41	II	Sh.	I.	38.4	-57.1
17/10/2010	0.03.12	I	Occ.	D.	30.9	-54.1
17/10/2010	0.31.40	II	Tr.	E.	26.6	-51.2
17/10/2010	1.48.31	II	Sh.	E.	13.7	-40.2
17/10/2010	2.55.25	I	Ec.	R.	1.7	-28.7
17/10/2010	21.13.59	I	Tr.	I.	44.7	-50.3
17/10/2010	21.54.09	I	Sh.	I.	43.6	-54.6
17/10/2010	23.28.18	I	Tr.	E.	35.1	-56.8
18/10/2010	0.08.53	I	Sh.	E.	29.4	-53.9
18/10/2010	16.12.09	II	Occ.	D.	9.6	2.0
18/10/2010	18.29.33	I	Occ.	D.	32.2	-23.7
18/10/2010	20.22.34	II	Ec.	R.	43.5	-43.3
18/10/2010	21.24.09	I	Ec.	R.	44.5	-51.9
19/10/2010	15.40.33	I	Tr.	I.	4.6	7.1
19/10/2010	16.23.07	I	Sh.	I.	12.3	0.0
19/10/2010	17.54.54	I	Tr.	E.	27.7	-17.5
19/10/2010	18.37.50	I	Sh.	E.	33.9	-25.5
20/10/2010	7.03.36	III	Occ.	D.	-43.4	15.4

Date	Time	M	Phe	Pha	h	h S
20/10/2010	10.57.01	II	Tr.	I.	-43.5	37.6
20/10/2010	12.22.32	II	Sh.	I.	-30.8	34.0
20/10/2010	12.55.57	I	Occ.	D.	-25.1	30.9
20/10/2010	12.57.09	III	Ec.	R.	-24.9	30.8
20/10/2010	13.40.14	II	Tr.	E.	-17.1	25.6
20/10/2010	15.06.12	II	Sh.	E.	-0.5	12.7
20/10/2010	15.52.52	I	Ec.	R.	7.6	4.7
21/10/2010	10.07.04	I	Tr.	I.	-48.4	36.1
21/10/2010	10.52.01	I	Sh.	I.	-43.6	37.3
21/10/2010	12.21.29	I	Tr.	E.	-30.3	33.8
21/10/2010	13.06.42	I	Sh.	E.	-22.4	29.4
22/10/2010	5.21.26	II	Occ.	D.	-29.3	-2.2
22/10/2010	7.22.24	I	Occ.	D.	-46.6	17.8
22/10/2010	9.41.24	II	Ec.	R.	-50.0	34.2
22/10/2010	10.21.36	I	Ec.	R.	-46.7	36.3
23/10/2010	4.33.45	I	Tr.	I.	-21.7	-11.8
23/10/2010	5.20.59	I	Sh.	I.	-29.9	-2.6
23/10/2010	6.48.13	I	Tr.	E.	-43.1	12.2
23/10/2010	7.35.40	I	Sh.	E.	-48.3	19.6
23/10/2010	20.52.26	III	Tr.	I.	44.4	-49.4
23/10/2010	23.50.32	III	Tr.	E.	28.1	-57.4
24/10/2010	0.05.50	II	Tr.	I.	25.8	-56.1
24/10/2010	0.06.20	III	Sh.	I.	25.7	-56.0
24/10/2010	1.40.25	II	Sh.	I.	9.6	-43.2
24/10/2010	1.48.58	I	Occ.	D.	8.1	-41.8
24/10/2010	2.49.16	II	Tr.	E.	-2.7	-31.3
24/10/2010	3.05.18	III	Sh.	E.	-6.2	-28.3
24/10/2010	4.23.56	II	Sh.	E.	-20.7	-13.8
24/10/2010	4.50.21	I	Ec.	R.	-25.4	-9.0
24/10/2010	23.00.24	I	Tr.	I.	34.6	-60.0
24/10/2010	23.49.52	I	Sh.	I.	27.6	-57.8
25/10/2010	1.14.54	I	Tr.	E.	13.4	-47.5
25/10/2010	2.04.31	I	Tr.	E.	4.5	-39.4
25/10/2010	18.32.07	II	Occ.	D.	36.2	-26.0
25/10/2010	20.15.35	I	Occ.	D.	44.1	-44.2
25/10/2010	23.01.08	II	Ec.	R.	33.9	-60.3
25/10/2010	23.19.07	I	Ec.	R.	31.5	-59.9
26/10/2010	17.27.13	I	Tr.	I.	27.8	-14.2
26/10/2010	18.18.52	I	Tr.	I.	35.1	-23.8
26/10/2010	19.41.46	I	Sh.	E.	42.9	-38.8
26/10/2010	20.33.30	I	Sh.	E.	44.4	-47.4
27/10/2010	10.28.11	III	Occ.	D.	-43.6	34.8
27/10/2010	13.15.10	II	Tr.	E.	-16.4	26.5
27/10/2010	13.27.53	III	Occ.	R.	-14.1	25.0
27/10/2010	13.58.49	III	Ec.	D.	-8.4	20.9
27/10/2010	14.42.15	I	Occ.	D.	0.3	14.5
27/10/2010	14.58.20	I	Sh.	I.	3.0	12.0
27/10/2010	15.58.50	II	Tr.	E.	13.8	2.0
27/10/2010	16.57.48	III	Ec.	R.	23.8	-9.0
27/10/2010	17.41.42	II	Sh.	E.	30.6	-17.1
27/10/2010	17.47.52	I	Ec.	R.	31.5	-18.3
28/10/2010	11.54.02	I	Tr.	I.	-30.1	33.2
28/10/2010	12.47.47	I	Tr.	I.	-20.7	29.1
28/10/2010	14.08.37	I	Sh.	E.	-5.7	19.3
28/10/2010	15.02.24	I	Sh.	E.	4.5	11.1
29/10/2010	7.42.29	II	Occ.	D.	-50.7	19.0
29/10/2010	9.08.59	I	Occ.	D.	-50.4	29.4
29/10/2010	12.16.37	I	Ec.	R.	-25.5	31.5
29/10/2010	12.19.59	II	Ec.	R.	-24.9	31.2
30/10/2010	6.20.59	I	Tr.	I.	-43.6	6.1
30/10/2010	7.16.48	I	Sh.	I.	-49.3	15.0
30/10/2010	8.35.38	I	Tr.	E.	-51.6	25.6
30/10/2010	9.31.23	I	Sh.	E.	-48.4	30.9
31/10/2010	0.20.32	III	Tr.	I.	18.4	-56.5
31/10/2010	2.25.03	II	Tr.	I.	-4.1	-37.1
31/10/2010	3.20.39	III	Tr.	E.	-14.7	-27.0
31/10/2010	3.35.49	I	Occ.	D.	-17.4	-24.2
31/10/2010	4.09.56	III	Sh.	I.	-23.6	-17.8
31/10/2010	4.16.16	II	Sh.	I.	-24.7	-16.7
31/10/2010	5.08.55	II	Tr.	E.	-33.7	-7.0
31/10/2010	6.45.24	I	Ec.	R.	-46.9	9.8
31/10/2010	6.59.29	II	Sh.	E.	-48.2	12.1
31/10/2010	7.07.44	III	Sh.	E.	-48.9	13.4
01/11/2010	0.47.55	I	Tr.	I.	12.8	-53.2
01/11/2010	1.45.42	I	Sh.	I.	2.5	-44.2
01/11/2010	3.02.36	I	Tr.	E.	-12.1	-30.5
01/11/2010	4.00.16	I	Sh.	E.	-22.6	-19.8
01/11/2010	20.54.18	II	Occ.	D.	43.0	-52.1
01/11/2010	22.02.43	I	Occ.	D.	37.3	-60.3
02/11/2010	1.14.11	I	Ec.	R.	7.4	-49.6
02/11/2010	1.39.46	II	Ec.	R.	2.8	-45.4
02/11/2010	19.15.02	I	Tr.	I.	42.9	-35.7
02/11/2010	20.14.43	I	Sh.	I.	44.2	-46.1
02/11/2010	21.29.46	I	Tr.	E.	40.2	-57.2
02/11/2010	22.29.16	I	Sh.	E.	33.6	-62.4
03/11/2010	13.57.07	III	Occ.	D.	-2.9	19.3
03/11/2010	15.35.27	II	Tr.	I.	-14.7	4.2

Date	Time	M	Phe	Pha	h	h S
03/11/2010	16.29.41	I	Occ.	D.	23.9	-5.4
03/11/2010	16.58.41	III	Occ.	R.	28.4	-10.7
03/11/2010	17.34.11	II	Sh.	I.	33.5	-17.2
03/11/2010	18.00.40	III	Ec.	D.	36.8	-22.1
03/11/2010	18.19.33	II	Tr.	E.	38.8	-25.6
03/11/2010	19.42.57	I	Ec.	R.	44.0	-40.9
03/11/2010	20.17.17	II	Sh.	E.	44.0	-46.8
03/11/2010	20.58.30	III	Ec.	R.	42.3	-53.3

Date	Time	M	Phe	Pha	h	h S
17/11/2010	2.21.00	I	Sh.	E.	-16.5	-41.3
17/11/2010	20.08.15	I	Occ.	D.	41.8	-47.7
17/11/2010	20.23.17	II	Tr.	I.	40.6	-50.3
17/11/2010	21.10.31	III	Occ.	D.	35.8	-57.9
17/11/2010	22.46.11	II	Sh.	I.	21.8	-67.0
17/11/2010	23.08.07	II	Tr.	E.	18.1	-67.0
17/11/2010	23.33.22	I	Ec.	R.	13.7	-65.9
18/11/2010	0.15.13	III	Occ.	R.	6.3	-61.8
18/11/2010	1.28.43	II	Sh.	E.	-7.6	-50.7
18/11/2010	2.05.24	III	Ec.	D.	-14.4	-44.3
18/11/2010	5.00.53	III	Ec.	R.	-43.3	-12.1
18/11/2010	17.22.13	I	Tr.	I.	39.0	-17.4
18/11/2010	18.35.38	I	Sh.	I.	43.8	-30.9
18/11/2010	19.37.17	I	Tr.	E.	43.3	-42.3
18/11/2010	20.49.57	I	Sh.	E.	37.7	-54.8
19/11/2010	14.35.55	I	Occ.	D.	15.5	10.6
19/11/2010	15.00.18	II	Occ.	D.	19.7	7.0
19/11/2010	18.02.11	I	Ec.	R.	42.5	-24.8
19/11/2010	20.16.12	II	Ec.	R.	40.6	-49.3
20/11/2010	11.50.09	I	Tr.	I.	-14.3	27.1
20/11/2010	13.04.42	I	Sh.	I.	0.2	21.7
20/11/2010	14.05.14	I	Tr.	E.	10.8	14.7
20/11/2010	15.19.00	I	Sh.	E.	23.4	4.0
20/11/2010	20.29.12	IV	Tr.	I.	39.0	-51.7
20/11/2010	21.08.26	IV	Tr.	E.	34.6	-58.0
21/11/2010	9.03.42	I	Occ.	D.	-41.6	22.7
21/11/2010	9.36.48	II	Tr.	I.	-36.7	25.3
21/11/2010	11.12.16	III	Tr.	I.	-20.5	28.0
21/11/2010	12.04.13	II	Sh.	I.	-11.0	26.2
21/11/2010	12.21.46	II	Tr.	E.	-7.7	25.1
21/11/2010	12.31.01	I	Ec.	R.	-6.0	24.4
21/11/2010	14.17.08	III	Tr.	E.	13.6	12.9
21/11/2010	14.46.37	II	Sh.	E.	18.7	8.7
21/11/2010	16.18.41	III	Sh.	I.	33.0	-6.4
21/11/2010	19.12.51	III	Sh.	E.	43.8	-38.1
22/11/2010	6.18.02	I	Tr.	I.	-51.4	0.9
22/11/2010	7.33.39	I	Sh.	I.	-50.4	12.1
22/11/2010	8.33.10	I	Tr.	E.	-45.0	19.5
22/11/2010	9.47.56	I	Sh.	E.	-34.3	25.8
23/11/2010	3.31.33	I	Occ.	D.	-33.0	-29.4
23/11/2010	4.16.01	II	Occ.	D.	-39.9	-21.2
23/11/2010	6.59.52	I	Ec.	R.	-51.7	7.0
23/11/2010	9.36.02	II	Ec.	R.	-35.6	24.8
24/11/2010	0.46.08	I	Tr.	I.	-3.7	-58.8
24/11/2010	2.02.43	I	Sh.	I.	-18.1	-45.9
24/11/2010	3.01.16	I	Tr.	E.	-28.5	-35.1
24/11/2010	4.16.58	I	Sh.	E.	-40.5	-21.2
24/11/2010	21.59.28	I	Occ.	D.	25.0	-65.3
24/11/2010	22.50.56	II	Tr.	I.	16.4	-68.6
25/11/2010	0.55.53	III	Occ.	D.	-6.5	-57.5
25/11/2010	1.22.17	II	Sh.	I.	-11.4	-53.1
25/11/2010	1.28.41	I	Ec.	R.	-12.6	-52.0
25/11/2010	1.36.03	II	Tr.	E.	-14.0	-50.8
25/11/2010	4.01.47	III	Occ.	R.	-38.9	-24.1
25/11/2010	4.04.34	II	Sh.	E.	-39.3	-23.6
25/11/2010	6.08.45	III	Ec.	D.	-51.4	-0.9
25/11/2010	9.03.01	III	Ec.	R.	-39.4	21.8
25/11/2010	19.14.12	I	Tr.	I.	43.2	-38.6
25/11/2010	20.31.42	I	Sh.	I.	36.7	-52.6
25/11/2010	21.29.23	I	Tr.	E.	29.0	-61.7
25/11/2010	22.45.55	I	Sh.	E.	16.6	-68.7
26/11/2010	16.27.27	I	Occ.	D.	36.5	-8.3
26/11/2010	17.31.25	II	Occ.	D.	42.4	-19.7
26/11/2010	19.57.31	I	Ec.	R.	39.9	-46.6
26/11/2010	22.54.59	II	Ec.	R.	14.4	-69.0
27/11/2010	13.42.27	I	Tr.	I.	11.6	16.5
27/11/2010	15.00.47	I	Sh.	I.	24.9	6.0
27/11/2010	15.57.39	I	Tr.	E.	33.3	-2.8
27/11/2010	17.14.58	I	Sh.	E.	41.5	-16.8
28/11/2010	10.55.32	I	Occ.	D.	-18.6	26.7
28/11/2010	12.05.42	II	Tr.	I.	-5.6	24.9
28/11/2010	14.26.21	I	Ec.	R.	19.9	10.8
28/11/2010	14.40.22	II	Sh.	I.	22.3	8.9
28/11/2010	14.50.56	II	Tr.	E.	24.0	7.3
28/11/2010	14.59.26	III	Tr.	I.	25.3	6.1
28/11/2010	17.22.30	II	Sh.	E.	42.3	-18.2
28/11/2010	18.05.23	III	Tr.	E.	44.1	-26.0
28/11/2010	20.21.16	III	Sh.	I.	36.6	-50.9
28/11/2010	23.14.14	III	Sh.	E.	9.6	-69.2
29/11/2010	4.50.00	IV	Occ.	D.	-46.9	-16.0
29/11/2010	6.15.05	IV	Occ.	R.	-51.8	-0.6
29/11/2010	8.10.40	I	Tr.	I.	-44.4	15.5
29/11/2010	9.29.44	I	Sh.	I.	-32.8	23.2
29/11/2010	10.25.52	I	Tr.	E.	-23.2	26.0
29/11/2010	11.43.54	I	Sh.	E.	-9.0	25.7
30/11/2010	5.23.42	I	Occ.	D.	-50.1	-10.3
30/11/2010	6.48.22	II	Occ.	D.	-51.1	4.0

Date	Time	M	Phe	Pha	h	h S
30/11/2010	8.55.13	I	Ec.	R.	-37.7	20.1
30/11/2010	12.14.47	II	Ec.	R.	-1.7	24.1
01/12/2010	2.39.04	I	Tr.	I.	-29.2	-40.4
01/12/2010	3.58.49	I	Sh.	I.	-41.6	-25.7
01/12/2010	4.54.17	I	Tr.	E.	-48.1	-15.6
01/12/2010	6.12.56	I	Sh.	E.	-51.8	-1.3
01/12/2010	23.51.55	I	Occ.	D.	-1.0	-67.3
02/12/2010	1.21.06	II	Tr.	I.	-16.0	-54.6
02/12/2010	3.24.03	I	Ec.	R.	-37.1	-32.3
02/12/2010	3.58.31	II	Sh.	I.	-42.1	-25.9
02/12/2010	4.06.29	II	Tr.	E.	-43.1	-24.4
02/12/2010	4.45.49	III	Occ.	D.	-47.6	-17.3
02/12/2010	6.40.33	II	Sh.	E.	-51.0	2.5
02/12/2010	7.52.37	III	Occ.	R.	-45.1	12.7
02/12/2010	10.11.29	III	Ec.	D.	-23.7	25.0
02/12/2010	13.04.31	III	Ec.	R.	8.3	20.0
02/12/2010	21.07.27	I	Tr.	I.	28.4	-58.9
02/12/2010	22.27.48	I	Sh.	I.	15.2	-68.8
02/12/2010	23.22.42	I	Tr.	E.	5.4	-69.6
03/12/2010	0.41.54	I	Sh.	E.	-9.5	-61.1
03/12/2010	18.20.13	I	Occ.	D.	44.1	-28.9
03/12/2010	20.05.02	II	Occ.	D.	36.4	-48.2
03/12/2010	21.52.54	I	Ec.	R.	20.6	-65.5
04/12/2010	1.33.42	II	Ec.	R.	-19.7	-52.7
04/12/2010	15.36.00	I	Tr.	I.	34.1	0.4
04/12/2010	16.56.53	I	Sh.	I.	42.3	-13.8
04/12/2010	17.51.16	I	Tr.	E.	44.3	-23.6
04/12/2010	19.10.57	I	Sh.	E.	41.4	-38.3
05/12/2010	12.48.36	I	Occ.	D.	7.5	21.1
05/12/2010	14.37.04	II	Tr.	I.	26.1	8.9
05/12/2010	16.21.44	I	Ec.	R.	39.7	-7.7
05/12/2010	17.16.38	II	Sh.	I.	43.6	-17.3
05/12/2010	17.22.33	II	Tr.	E.	43.8	-18.4
05/12/2010	18.51.58	III	Tr.	I.	42.5	-34.8
05/12/2010	19.58.32	II	Sh.	E.	36.4	-47.1
05/12/2010	21.58.45	III	Tr.	E.	18.4	-66.3
06/12/2010	0.24.15	III	Sh.	I.	-8.2	-64.1
06/12/2010	3.16.00	III	Sh.	E.	-38.1	-34.4
06/12/2010	10.04.31	I	Tr.	I.	-22.2	24.1
06/12/2010	11.25.51	I	Sh.	I.	-7.3	25.3
06/12/2010	12.19.48	I	Tr.	E.	3.0	23.1
06/12/2010	13.39.53	I	Sh.	E.	17.3	16.1
07/12/2010	7.17.05	I	Occ.	D.	-46.8	7.1
07/12/2010	9.23.14	II	Occ.	D.	-28.8	21.4
07/12/2010	10.50.37	I	Ec.	R.	-13.1	25.3
07/12/2010	13.25.18	IV	Tr.	I.	15.4	17.6
07/12/2010	14.43.14	IV	Tr.	E.	28.2	8.0
07/12/2010	14.53.27	II	Ec.	R.	29.8	6.5
08/12/2010	4.33.13	I	Tr.	I.	-48.4	-20.5
08/12/2010	5.54.55	I	Sh.	I.	-51.5	-6.2
08/12/2010	6.48.31	I	Tr.	E.	-49.0	2.8
08/12/2010	8.08.56	I	Sh.	E.	-39.9	13.8
09/12/2010	1.45.36	I	Occ.	D.	-25.0	-51.4
09/12/2010	3.53.41	II	Tr.	I.	-44.6	-27.9
09/12/2010	5.19.28	I	Ec.	R.	-51.2	-12.4
09/12/2010	6.34.48	II	Sh.	I.	-49.7	0.7
09/12/2010	6.39.15	II	Tr.	E.	-49.4	1.3
09/12/2010	8.41.05	III	Occ.	D.	-34.5	17.3
09/12/2010	9.16.36	II	Sh.	E.	-28.6	20.6
09/12/2010	11.48.32	III	Occ.	R.	-0.3	24.4
09/12/2010	14.14.26	III	Ec.	D.	24.9	11.8
09/12/2010	17.06.13	III	Ec.	R.	43.9	-15.4
09/12/2010	23.01.55	I	Tr.	I.	4.6	-70.9
10/12/2010	0.23.55	I	Sh.	I.	-10.8	-64.7
10/12/2010	1.17.13	I	Tr.	E.	-20.6	-56.5
10/12/2010	2.37.53	I	Sh.	E.	-34.4	-42.0
10/12/2010	20.14.12	I	Occ.	D.	32.0	-49.8
10/12/2010	22.41.08	II	Occ.	D.	7.7	-70.3
10/12/2010	23.48.20	I	Ec.	R.	-4.8	-68.9
11/12/2010	4.12.25	II	Ec.	R.	-47.4	-24.7
11/12/2010	17.30.46	I	Tr.	I.	44.6	-19.8
11/12/2010	18.53.00	I	Sh.	I.	41.0	-34.9
11/12/2010	19.46.05	I	Tr.	E.	35.3	-44.7
11/12/2010	21.06.56	I	Sh.	E.	23.5	-58.9
12/12/2010	14.42.52	I	Occ.	D.	31.0	8.0
12/12/2010	17.10.50	II	Tr.	I.	44.4	-16.2
12/12/2010	18.17.11	I	Ec.	R.	43.3	-28.2
12/12/2010	19.52.58	II	Sh.	I.	34.0	-45.9
12/12/2010	19.56.28	II	Tr.	E.	33.5	-46.5
12/12/2010	22.34.37	II	Sh.	E.	7.6	-70.0
12/12/2010	22.49.39	III	Tr.	I.	4.9	-70.8
13/12/2010	1.56.58	III	Tr.	E.	-29.4	-49.9
13/12/2010	4.27.21	III	Sh.	I.	-49.2	-22.2
13/12/2010	7.17.51	III	Sh.	E.	-44.1	6.4
13/12/2010	11.59.35	I	Tr.	I.	4.2	23.7
13/12/2010	13.21.57	I	Sh.	I.	18.8	17.7
13/12/2010	14.14.54	I	Tr.	E.	27.4	11.7

Date	Time	M	Phe	Pha	h	h S
13/12/2010	15.35.52	I	Sh.	E.	38.3	0.4
14/12/2010	9.11.38	I	Occ.	D.	-26.2	19.6
14/12/2010	12.00.27	II	Occ.	D.	5.0	23.6
14/12/2010	12.46.05	I	Ec.	R.	13.2	20.9
14/12/2010	17.32.05	II	Ec.	R.	44.6	-19.9
15/12/2010	6.28.34	I	Tr.	I.	-48.4	-0.8
15/12/2010	7.51.01	I	Sh.	I.	-38.6	10.7
15/12/2010	8.43.53	I	Tr.	E.	-30.3	16.9
15/12/2010	10.04.55	I	Sh.	E.	-16.0	23.2
15/12/2010	22.26.30	IV	Occ.	D.	7.2	-69.5
16/12/2010	0.07.09	IV	Occ.	R.	-11.6	-67.5
16/12/2010	3.40.26	I	Occ.	D.	-45.8	-31.2
16/12/2010	6.28.37	II	Tr.	I.	-48.0	-0.9
16/12/2010	7.14.55	I	Ec.	R.	-43.0	5.6
16/12/2010	9.11.12	II	Sh.	I.	-24.9	19.4
16/12/2010	9.14.20	II	Tr.	E.	-24.4	19.7
16/12/2010	11.52.44	II	Sh.	E.	5.0	23.9
16/12/2010	12.40.27	III	Occ.	D.	13.5	21.3
16/12/2010	15.48.15	III	Occ.	R.	40.7	-1.2
16/12/2010	18.16.45	III	Ec.	D.	42.6	-27.9
16/12/2010	21.07.18	III	Ec.	R.	20.5	-58.8
17/12/2010	0.57.32	I	Tr.	I.	-21.5	-60.6
17/12/2010	2.20.01	I	Sh.	I.	-35.4	-46.2
17/12/2010	3.12.51	I	Tr.	E.	-42.9	-36.4
17/12/2010	4.33.53	I	Sh.	E.	-50.3	-21.5
17/12/2010	22.09.18	I	Occ.	D.	9.1	-67.7
18/12/2010	1.19.28	II	Occ.	D.	-25.9	-57.1
18/12/2010	1.43.47	I	Ec.	R.	-30.1	-52.8
18/12/2010	6.50.59	II	Ec.	R.	-45.0	2.0
18/12/2010	19.26.39	I	Tr.	I.	34.8	-40.7
18/12/2010	20.49.06	I	Sh.	I.	22.4	-55.6
18/12/2010	21.41.59	I	Tr.	E.	13.3	-64.1
18/12/2010	23.02.56	I	Sh.	E.	-0.8	-71.4
19/12/2010	16.38.15	I	Occ.	D.	44.5	-10.1
19/12/2010	19.46.54	II	Tr.	I.	31.6	-44.4
19/12/2010	20.12.39	I	Ec.	R.	27.8	-49.1
19/12/2010	22.29.26	II	Sh.	I.	4.2	-69.7
19/12/2010	22.32.40	II	Tr.	E.	3.6	-69.9
20/12/2010	1.10.52	II	Sh.	E.	-25.6	-58.7
20/12/2010	2.52.53	III	Tr.	I.	-41.6	-40.5
20/12/2010	6.00.28	III	Tr.	E.	-49.0	-6.7
20/12/2010	8.31.18	III	Sh.	I.	-29.2	15.1
20/12/2010	11.20.33	III	Sh.	E.	1.9	24.6
20/12/2010	13.55.44	I	Tr.	I.	28.6	14.2
20/12/2010	15.18.03	I	Sh.	I.	39.3	3.3
20/12/2010	16.11.03	I	Tr.	E.	43.6	-5.4
20/12/2010	17.31.52	I	Sh.	E.	44.3	-19.4
21/12/2010	11.07.17	I	Occ.	D.	0.3	24.6
21/12/2010	14.39.50	II	Occ.	D.	35.3	8.7
21/12/2010	14.41.33	I	Ec.	R.	35.6	8.5
21/12/2010	20.10.35	II	Ec.	R.	27.0	-48.5
22/12/2010	8.24.58	I	Tr.	I.	-29.0	14.3
22/12/2010	9.47.07	I	Sh.	I.	-14.4	21.8
22/12/2010	10.40.17	I	Tr.	E.	-4.4	24.2
22/12/2010	12.00.53	I	Sh.	E.	10.5	23.6
23/12/2010	5.36.20	I	Occ.	D.	-49.7	-11.1
23/12/2010	9.05.44	II	Tr.	I.	-21.3	18.5
23/12/2010	9.10.24	I	Ec.	R.	-20.4	18.9
23/12/2010	11.47.41	II	Sh.	I.	8.8	24.1
23/12/2010	11.51.32	II	Tr.	E.	9.4	23.9
23/12/2010	14.29.00	II	Sh.	E.	34.9	10.3
23/12/2010	16.44.12	III	Occ.	D.	45.0	-10.8
23/12/2010	19.52.06	III	Occ.	R.	28.9	-45.0
23/12/2010	22.19.02	III	Ec.	D.	3.7	-68.5
24/12/2010	1.08.21	III	Ec.	R.	-27.5	-59.4
24/12/2010	2.54.12	I	Tr.	I.	-43.4	-40.6
24/12/2010	4.16.06	I	Sh.	I.	-50.3	-25.4
24/12/2010	5.09.30	I	Tr.	E.	-50.6	-15.8
24/12/2010	6.29.51	I	Sh.	E.	-44.7	-1.4
24/12/2010	7.35.50	IV	Tr.	I.	-35.8	7.9
24/12/2010	9.04.14	IV	Tr.	E.	-20.9	18.3
25/12/2010	0.05.28	I	Occ.	D.	-16.9	-68.3
25/12/2010	3.39.16	I	Ec.	R.	-48.3	-32.3
25/12/2010	3.59.56	II	Occ.	D.	-49.7	-28.5
25/12/2010	9.29.28	II	Ec.	R.	-15.6	20.5
25/12/2010	21.23.34	I	Tr.	I.	12.4	60.7
25/12/2010	22.45.11	I	Sh.	I.	-2.0	-70.5
25/12/2010	23.38.53	I	Tr.	E.	-12.7	-70.6
26/12/2010	0.58.53	I	Sh.	E.	-27.0	-61.1
26/12/2010	18.34.39	I	Occ.	D.	38.0	-30.3
26/12/2010	22.08.07	I	Ec.	R.	3.8	-67.0
26/12/2010	22.25.03	II	Tr.	I.	0.9	-68.9
27/12/2010	1.05.57	II	Sh.	I.	-28.8	-60.0
27/12/2010	1.10.53	II	Tr.	E.	-29.6	-59.2
27/12/2010	3.47.10	II	Sh.	E.	-49.3	-31.0
27/12/2010	6.59.44	III	Tr.	I.	-39.4	2.6
27/12/2010	10.07.17	III	Tr.	E	-7.3	23.0

Date	Time	M	Phe	Pha	h	h S
27/12/2010	12.34.26	III	Sh.	I.	19.6	22.1
27/12/2010	15.22.26	III	Sh.	E.	42.3	3.2
27/12/2010	15.52.53	I	Tr.	I.	44.2	-1.0
27/12/2010	17.14.08	I	Sh.	I.	44.4	-15.6
27/12/2010	18.08.11	I	Tr.	E.	40.5	-25.3
27/12/2010	19.27.48	I	Sh.	E.	30.6	-40.0
28/12/2010	13.03.56	I	Occ.	D.	25.2	20.0
28/12/2010	16.37.02	I	Ec.	R.	45.3	-9.0
28/12/2010	17.21.16	II	Occ.	D.	43.9	-16.7
28/12/2010	22.49.00	II	Ec.	R.	-5.2	-70.6

Date	Time	M	Phe	Pha	h	h S
29/12/2010	10.22.22	I	Tr.	I.	-2.5	23.7
29/12/2010	11.43.11	I	Sh.	I.	11.9	24.5
29/12/2010	12.37.39	I	Tr.	E.	21.4	22.0
29/12/2010	13.56.49	I	Sh.	E.	33.7	14.8
30/12/2010	7.33.14	I	Occ.	D.	-32.6	7.3
30/12/2010	11.05.53	I	Ec.	R.	5.9	24.8
30/12/2010	11.44.54	II	Tr.	I.	12.9	24.5
30/12/2010	14.24.15	II	Sh.	I.	37.7	11.6
30/12/2010	14.30.45	II	Tr.	E.	38.5	10.7
30/12/2010	17.05.20	II	Sh.	E.	44.5	-13.7

Date	Time	M	Phe	Pha	h	h S
30/12/2010	20.52.23	III	Occ.	D.	15.1	-55.0
31/12/2010	0.00.12	III	Occ.	R.	-19.6	-68.9
31/12/2010	2.21.43	III	Ec.	D.	-42.1	-47.0
31/12/2010	4.51.49	I	Tr.	I.	-50.1	-19.4
31/12/2010	5.09.49	III	Ec.	R.	-49.2	-16.2
31/12/2010	6.12.10	I	Sh.	I.	-43.6	-5.4
31/12/2010	7.07.06	I	Tr.	E.	-36.1	3.6
31/12/2010	8.25.46	I	Sh.	E.	-23.1	14.1

Date = data  
 Time = orario  
 Phe = fenomeno  
 Pha = fase  
 H = altitudine di Giove sull'orizzonte  
 H S = altitudine del Sole sull'orizzonte

Date in the format dd/mm/yyyy  
 Phe = phenomenon  
 Pha = phase  
 H = altitude of Jupiter above the horizon  
 H S = altitude of the Sun above the horizon

# FENOMENI MULTIPLI DEI SATELLITI DI GIOVE

## MULTIPLA PHENOMENA OF THE SATELLITES OF JUPITER

### DOPPI TRANSITI DI SATELLITI

-

### DOUBLE TRANSITS OF THE SATELLITES

YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC	YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC
2010 1 23 7 57 34	2010 1 23 10 46 17	0101	2010 3 31 22 40 7	2010 4 1 0 56 11	1001
2010 3 3 14 33 42	2010 3 3 14 37 20	1100	2010 4 4 12 42 20	2010 4 4 13 56 38	1100
2010 3 7 3 34 42	2010 3 7 4 4 31	1100	2010 4 8 2 7 53	2010 4 8 2 56 59	1100
2010 3 10 16 35 36	2010 3 10 17 30 47	1100	2010 4 11 15 34 12	2010 4 11 15 57 16	1100
2010 3 14 5 36 31	2010 3 14 6 57 51	1100	2010 5 4 14 17 42	2010 5 4 16 26 24	1001
2010 3 16 0 6 57	2010 3 16 0 7 19	1010	2010 6 7 6 27 13	2010 6 7 7 40 47	1001
2010 3 17 18 37 21	2010 3 17 20 23 58	1100	2010 8 6 9 21 11	2010 8 6 11 1 53	1010
2010 3 21 7 38 9	2010 3 21 9 50 52	1100	2010 8 13 11 45 18	2010 8 13 13 21 25	1010
2010 3 23 2 8 31	2010 3 23 4 24 46	1010	2010 10 31 2 26 5	2010 10 31 3 21 42	0110
2010 3 24 20 38 51	2010 3 24 22 55 5	1100	2010 11 7 4 47 31	2010 11 7 6 55 38	0110
2010 3 28 9 49 54	2010 3 28 11 55 41	1100	2010 11 14 7 31 10	2010 11 14 9 56 5	0110
2010 3 30 5 38 50	2010 3 30 6 25 56	1010	2010 11 21 11 13 16	2010 11 21 12 22 47	0110

Esempio di lettura : il 3 marzo dalle 14.33 alle 14.37 Io ed Europa saranno contemporaneamente in transito

Example : on 3 March from 14.33 to 14.37 Io and Europa will be simultaneously in transit

### TRIPLI TRANSITI DI SATELLITI

-

### TRIPLE TRANSITS OF THE SATELLITES

YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC
2010 3 31 23 15 44	2010 4 1 0 20 38	1101

### DOPPI TRANSITI DI OMBRE

-

### DOUBLE TRANSITS OF SHADOWS

YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC	YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC
2010 1 23 15 59 33	2010 1 23 18 16 19	1001	2010 4 6 7 32 50	2010 4 6 7 48 52	1010
2010 3 3 14 30 26	2010 3 3 14 30 2	1100	2010 4 8 0 45 57	2010 4 8 2 17 21	1100
2010 3 7 3 27 40	2010 3 7 3 49 26	1100	2010 4 11 14 5 19	2010 4 11 15 14 20	1100
2010 3 10 16 24 49	2010 3 10 17 7 58	1100	2010 4 15 3 23 42	2010 4 15 4 11 16	1100
2010 3 14 5 21 60	2010 3 14 6 27 20	1100	2010 4 18 16 43 0	2010 4 18 17 8 13	1100
2010 3 17 18 19 6	2010 3 17 19 45 49	1100	2010 4 22 6 1 22	2010 4 22 6 5 7	1100
2010 3 21 7 16 14	2010 3 21 9 5 10	1100	2010 8 13 10 11 22	2010 8 13 10 58 6	1010
2010 3 23 1 44 46	2010 3 23 2 58 56	1010	2010 8 20 12 5 47	2010 8 20 14 21 1	1010
2010 3 24 20 13 18	2010 3 24 22 23 39	1100	2010 8 27 15 50 11	2010 8 27 16 15 31	1010
2010 3 28 9 10 23	2010 3 28 11 26 23	1100	2010 10 16 23 5 43	2010 10 16 23 4 53	0110
2010 3 30 3 38 53	2010 3 30 5 54 53	1010	2010 10 24 1 41 27	2010 10 24 3 6 21	0110
2010 3 31 22 8 8	2010 4 1 0 23 23	1100	2010 10 31 4 17 18	2010 10 31 7 0 30	0110
2010 4 4 11 27 30	2010 4 4 13 20 24	1100	2010 11 7 8 13 52	2010 11 7 9 36 7	0110

### DOPPI-TRIPLI TRANSITI DI OMBRE E SATELLITI

-

### DOUBLE-TRIPLE TRANSITS OF SHADOWS AND SATELLITES

YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC	IEGC
2010 3 31 23 15 44	2010 4 1 0 20 38	1100	1101

Nell'ordine: tipo di fenomeno, anno/mese/giorno/ora/minuti/secondi di inizio e di fine  
Io, Europa, Ganimede, Callisto (1 = il satellite è coinvolto, 0 = non lo è)

Data nel formato aaaa/mm/gg - Tempi in T.D.T.

Io, Europa, Ganimede, Callisto (1 = the satellite is involved, 0 = it isn't)

Times in T.D.T.

# **DOPPIE ECLISSI - DOUBLE ECLIPSES**

YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC	YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC
2010 1 6 20 19 42	2010 1 6 20 41 5	1010	2010 10 18 19 11 18	2010 10 18 20 23 35	1100
2010 1 13 22 15 8	2010 1 14 0 32 43	1010	2010 10 22 8 8 48	2010 10 22 9 42 25	1100
2010 1 21 1 10 20	2010 1 21 2 28 6	1010	2010 10 25 21 6 22	2010 10 25 23 2 9	1100
2010 3 19 11 36 58	2010 3 19 12 51 38	0110	2010 10 27 15 35 9	2010 10 27 16 58 50	1010
2010 3 26 14 11 45	2010 3 26 16 52 22	0110	2010 10 29 10 3 55	2010 10 29 12 17 38	1100
2010 4 2 17 26 37	2010 4 2 19 36 41	0110	2010 11 1 23 1 32	2010 11 2 1 15 12	1100
2010 4 9 21 27 31	2010 4 9 22 11 12	0110	2010 11 3 18 1 41	2010 11 3 19 43 58	1010
2010 6 6 6 59 50	2010 6 6 8 54 11	1010	2010 11 5 12 13 42	2010 11 5 14 12 44	1100
2010 6 13 9 35 9	2010 6 13 11 10 6	1010	2010 11 9 1 33 41	2010 11 9 3 10 21	1100
2010 6 15 3 22 31	2010 6 15 5 2 6	1001	2010 11 12 14 52 47	2010 11 12 16 7 56	1100
2010 10 8 4 18 53	2010 10 8 4 25 33	1100	2010 11 16 4 12 47	2010 11 16 5 5 35	1100
2010 10 11 17 16 21	2010 10 11 17 45 10	1100	2010 11 19 17 31 54	2010 11 19 18 3 12	1100
2010 10 15 6 13 48	2010 10 15 7 3 54	1100	2010 11 23 6 51 56	2010 11 23 7 0 52	1100

Esempio di lettura : il 6 gennaio dalle 20.19 alle 20.41 Io e Ganimede saranno contemporaneamente eclissati

Example : on 6 January from 20.19 to 20.41 Io and Ganimede will be simultaneously eclipsed

# **DOPPIE OCCULTAZIONI - DOUBLE OCCULTATIONS**

YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC	YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC
2010 1 13 21 28 24	2010 1 13 21 37 7	1010	2010 11 1 22 3 45	2010 11 1 23 42 22	1100
2010 1 20 23 30 25	2010 1 21 1 48 31	1010	2010 11 3 16 30 43	2010 11 3 16 59 43	1010
2010 1 28 2 58 7	2010 1 28 3 50 49	1010	2010 11 5 10 57 45	2010 11 5 12 54 10	1100
2010 3 12 9 27 2	2010 3 12 9 43 8	0110	2010 11 8 23 52 6	2010 11 9 2 6 5	1100
2010 3 19 12 16 47	2010 3 19 14 14 44	0110	2010 11 10 18 19 22	2010 11 10 20 33 23	1010
2010 3 26 15 16 24	2010 3 26 17 56 46	0110	2010 11 12 12 32 49	2010 11 12 15 0 46	0101
2010 4 2 19 47 43	2010 4 2 20 45 19	0110	2010 11 16 1 47 12	2010 11 16 3 55 49	1100
2010 5 14 7 58 59	2010 5 14 10 14 55	1100	2010 11 17 21 11 31	2010 11 17 22 23 26	1010
2010 5 23 4 26 59	2010 5 23 5 52 4	1010	2010 11 19 15 1 21	2010 11 19 16 51 9	1100
2010 5 30 6 55 35	2010 5 30 8 39 57	1010	2010 11 23 4 17 3	2010 11 23 5 46 49	1100
2010 10 15 5 37 55	2010 10 15 5 49 12	1100	2010 11 26 17 32 27	2010 11 26 18 42 46	1100
2010 10 18 18 30 35	2010 10 18 18 59 10	1100	2010 11 30 6 49 25	2010 11 30 7 39 5	1100
2010 10 22 7 23 27	2010 10 22 8 8 45	1100	2010 12 3 20 6 4	2010 12 3 20 35 39	1100
2010 10 25 20 16 37	2010 10 25 21 19 40	1100	2010 12 7 9 24 16	2010 12 7 9 32 32	1100
2010 10 29 9 10 1	2010 10 29 10 30 18	1100			

# **TRIPLE OCCULTAZIONI - TRIPLE OCCULTATIONS**

YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC
2010 11 12 12 46 43	2010 11 12 13 12 31	1101

# **2 TRANSITI DI SATELLITI + 2 TRANSITI DI OMBRE - 2 TRANSITS OF SATELLITES + 2 TRANSITS OF SHADOWS**

YYYY MM DD hh mm ss	YYYY MM DD hh mm ss	IEGC	IEGC
2010 3 7 3 34 42	2010 3 7 3 49 26	1100	1100
2010 3 10 16 35 36	2010 3 10 17 7 58	1100	1100
2010 3 14 5 36 31	2010 3 14 6 27 20	1100	1100
2010 3 17 18 37 21	2010 3 17 19 45 49	1100	1100
2010 3 21 7 38 9	2010 3 21 9 5 10	1100	1100
2010 3 23 2 8 31	2010 3 23 2 58 56	1010	1010
2010 3 24 20 38 51	2010 3 24 22 23 39	1100	1100
2010 3 28 9 49 54	2010 3 28 11 26 23	1100	1100
2010 3 30 5 38 50	2010 3 30 5 54 53	1010	1010
2010 3 31 22 40 7	2010 4 1 0 23 23	1100	1001
2010 4 4 12 42 20	2010 4 4 13 20 24	1100	1100
2010 4 8 2 7 53	2010 4 8 2 17 21	1100	1100

Nell'ordine: tipo di fenomeno, anno/mese/giorno/ora/minuti/secondi di inizio e di fine  
Io, Europa, Ganimede, Callisto (1 = il satellite è coinvolto, 0 = non lo è)

Data nel formato aaaa/mm/gg - Tempi in T.D.T.

Io, Europa, Ganimede, Callisto (1 = the satellite is involved, 0 = it isn't)

Times in T.D.T.



**GIOVE SENZA SATELLITI - JUPITER WITHOUT SATELLITES**

YYYY MM GG hh mm ss    YYYY MM GG hh mm ss  
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**GIOVE CON UN SOLO SATELLITE - JUPITER WITH ONLY 1 SATELLITE**

YYYY	MM	DD	hh	mm	ss	YYYY	MM	DD	hh	mm	ss	I	E	G	C
2010	3	16	0	6	57	2010	3	16	0	7	19	1	1	1	0
2010	3	19	13	7	46	2010	3	19	14	14	44	1	1	1	0
2010	3	23	2	8	31	2010	3	23	4	24	46	1	1	1	0
2010	3	26	15	9	12	2010	3	26	17	25	23	1	1	1	0
2010	3	30	5	38	50	2010	3	30	6	25	56	1	1	1	0
2010	3	31	23	15	44	2010	4	1	0	20	38	1	1	0	1
2010	4	2	17	26	37	2010	4	2	19	26	25	1	1	1	0
2010	5	4	16	22	17	2010	5	4	16	26	24	1	1	0	1
2010	10	20	12	56	59	2010	10	20	12	58	11	1	1	1	0
2010	10	27	14	43	17	2010	10	27	15	59	51	1	1	1	0
2010	11	3	16	30	43	2010	11	3	16	59	43	1	1	1	0
2010	11	3	18	1	41	2010	11	3	18	20	34	1	1	1	0
2010	11	7	5	24	53	2010	11	7	6	55	38	1	1	1	0
2010	11	10	18	19	22	2010	11	10	20	35	29	1	1	1	0
2010	11	12	12	46	43	2010	11	12	13	12	31	1	1	0	1
2010	11	14	7	31	10	2010	11	14	9	56	5	1	1	1	0
2010	11	17	21	11	31	2010	11	17	23	9	9	1	1	1	0
2010	11	21	11	13	16	2010	11	21	12	22	47	1	1	1	0
2010	11	25	0	56	53	2010	11	25	1	29	42	1	1	1	0

**OCCULTAZIONE DI UN'OMBRA DI UN SATELLITE - OCCULTATION OF A SATELLITE'S SHADOW**

YYYY	MM	DD	hh	mm	ss	YYYY	MM	DD	hh	mm	ss	
2010	3	21	8	12	10	2010	3	21	8	38	52	2 → 1
2010	4	1	0	24	03	2010	4	1	0	48	52	1 → 2
2010	4	4	12	16	33	2010	4	4	12	41	23	1 → 2

X → Y il satellite X occulta l'ombra del satellite Y  
X → Y the satellite X occults the shadow of the satellite Y

**OCCULTAZIONE DI UN'OMBRA DA PARTE DI UN'ALTRA OMBRA DI UN SATELLITE  
OCCULTATION OF A SATELLITE'S SHADOW BY ANOTHER SATELLITE'S SHADOW**

YYYY	MM	DD	hh	mm	ss	YYYY	MM	DD	hh	mm	ss	
2010	3	28	10	14	45	2010	3	28	10	36	39	1 → 2
in entrata / in course						2010	3	31	22	16	27	1 → 2

X → Y l'ombra del satellite X occulta l'ombra del satellite Y  
X → Y the shadow of the satellite X occults the shadow of the satellite Y

Nell'ordine: tipo di fenomeno, anno/mese/giorno/ora/minuti/secondi di inizio e di fine  
Io, Europa, Ganimede, Callisto (1 = il satellite è coinvolto, 0 = non lo è)

Data nel formato aaaa/mm/gg - Tempi in T.D.T.

Io, Europa, Ganimede, Callisto (1 = the satellite is involved, 0 = it isn't)

Times in T.D.T.

# CONGIUNZ. TRIPLE TRA I SATELLITI DI GIOVE

## TRIPLE CONJUNCTIONS BETWEEN THE MOON OF JUPITER

DATA	ORA	CORPI	D12	D13	D23	CERCHIO	MAG1	MAG2	MAG3	MAGT
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Questo anno non avvengono fenomeni - No phenomena this year

D12 = distanza tra il primo satellite indicato ed il secondo, in raggi gioviani  
D13 = distanza tra il primo satellite indicato ed il terzo, in raggi gioviani  
D23 = distanza tra il secondo satellite indicato ed il terzo, in raggi gioviani

Un Rj raggio gioviano è pari a circa 20"

CERCHIO = cerchio minimo, in raggi gioviani, comprendente i 3 satelliti

MAG1 = magnitudine del primo satellite indicato  
MAG2 = magnitudine del secondo satellite indicato  
MAG3 = magnitudine del terzo satellite indicato  
MAGT = magnitudine totale del gruppo

Tempi in TDT                      Sono riportati solo gli eventi entro un cerchio minimo di 0.5 Rj

D12 = distance between the first and the second satellite, in jovian radii  
D13 = distance between the first and the third satellite, in jovian radii  
D23 = distance between the second and the third satellite, in jovian radii

Rj is almost 20"

GROUP = least grouping, in jovian radii

MAG1 = magnitude of the first satellite  
MAG2 = magnitude of the second satellite  
MAG3 = magnitude of the third satellite  
MAGT = total magnitude of the group

Times in TDT                      Are listed only the events under 0.5 Rj

# CONGIUNZIONI TRA I SATELLITI DI GIOVE

## CONJUNCTIONS BETWEEN THE MOONS OF JUPITER

Date	time	Moons	Dist."	h	h S
01/01/2010	18.26.30	I/II	1"	11.3	-28.0
03/01/2010	5.06.42	I/III	2"	-43.8	-16.8
03/01/2010	11.31.45	II/III	2"	22.7	25.1
04/01/2010	0.52.57	I/II	-1"	-56.2	-62.2
05/01/2010	7.39.05	I/II	1"	-15.0	8.2
06/01/2010	1.48.40	II/III	-1"	-60.9	-53.1
06/01/2010	6.07.52	I/III	-2"	-31.2	-6.2
06/01/2010	18.18.06	I/IV	5"	10.4	-25.7
07/01/2010	1.48.00	II/IV	5"	-60.9	-53.2
07/01/2010	14.04.40	I/II	-1"	34.9	15.1
08/01/2010	20.52.08	I/II	1"	-18.2	-53.6
10/01/2010	8.05.16	I/III	3"	-7.0	12.0
10/01/2010	15.06.45	II/III	2"	32.7	7.5
11/01/2010	3.16.28	I/II	-1"	-55.8	-37.1
12/01/2010	10.05.22	I/II	1"	14.9	24.1
13/01/2010	5.29.11	II/III	-2"	-33.9	-12.7
13/01/2010	9.30.47	I/III	-2"	9.9	21.7
14/01/2010	16.28.16	I/II	-1"	23.5	-4.8
14/01/2010	21.31.11	I/IV	-6"	-28.6	-58.9
15/01/2010	18.31.39	II/IV	-5"	4.0	-26.7
15/01/2010	23.19.08	I/II	1"	-47.7	-69.0
16/01/2010	7.51.40	III/IV	-5"	-5.8	10.7
17/01/2010	18.42.19	II/III	2"	1.3	-28.3
18/01/2010	5.40.07	I/II	-1"	-28.9	-10.5
19/01/2010	12.33.02	I/II	1"	34.4	25.7
20/01/2010	9.12.35	II/III	-2"	10.9	21.0
20/01/2010	13.15.38	I/III	-2"	35.8	22.7
21/01/2010	11.24.52	I/III	-2"	29.7	28.2
21/01/2010	18.52.00	I/II	-1"	-2.2	-29.4
22/01/2010	2.45.11	III/IV	7"	-54.7	-42.2
22/01/2010	10.56.31	II/IV	6"	26.9	28.1
23/01/2010	0.15.57	I/IV	6"	-57.1	-64.9
23/01/2010	1.47.30	I/II	1"	-59.2	-52.2
23/01/2010	7.55.48	II/IV	5"	-0.1	12.1
24/01/2010	9.33.18	II/IV	5"	16.4	23.7
24/01/2010	22.17.51	II/III	3"	-41.8	-63.1
25/01/2010	8.03.54	I/II	-2"	2.2	13.6
26/01/2010	15.02.07	I/II	1"	30.1	11.4
27/01/2010	12.59.21	II/III	-2"	36.4	25.8
27/01/2010	18.19.28	I/III	-2"	0.6	-22.2
27/01/2010	22.37.25	I/III	-1"	-46.2	-64.2
28/01/2010	15.24.05	I/III	-3"	27.1	8.6
28/01/2010	21.15.49	I/II	-2"	-32.9	-53.6
30/01/2010	4.17.23	I/II	1"	-36.5	-24.2
31/01/2010	1.54.20	II/IV	-6"	-56.4	-49.9
01/02/2010	1.53.26	II/III	3"	-56.2	-49.9
01/02/2010	7.45.04	I/IV	-6"	3.0	12.2
01/02/2010	10.27.42	I/II	-2"	27.9	29.5
02/02/2010	17.32.47	I/II	1"	5.6	-12.4
03/02/2010	16.49.12	II/III	-2"	12.5	-4.2
04/02/2010	18.54.54	I/III	-3"	-10.5	-27.1
04/02/2010	23.39.37	I/II	-2"	-56.4	-63.9
06/02/2010	6.48.55	I/II	1"	-4.2	4.4
07/02/2010	20.03.13	I/III	4"	-24.6	-39.0
08/02/2010	5.29.07	II/III	4"	-17.9	-9.5
08/02/2010	12.51.30	I/II	-2"	37.2	29.8
08/02/2010	18.09.58	II/IV	7"	-4.0	-18.0
09/02/2010	10.38.22	I/IV	8"	32.3	32.3
09/02/2010	20.05.13	I/II	1"	-26.0	-38.9
10/02/2010	13.05.56	III/IV	7"	36.6	29.2
10/02/2010	20.43.08	II/III	-3"	-33.3	-45.2
11/02/2010	22.13.17	I/III	-4"	-48.4	-57.7
12/02/2010	2.03.25	I/II	-2"	-50.5	-45.9
13/02/2010	9.22.23	I/II	1"	25.1	27.8
14/02/2010	23.06.04	I/III	4"	-55.3	-60.5
15/02/2010	9.04.51	II/III	4"	23.6	26.5
15/02/2010	15.15.15	I/II	-2"	22.3	14.3
16/02/2010	9.15.06	III/IV	-8"	25.5	27.9
16/02/2010	22.39.48	I/II	1"	-53.2	-58.5
17/02/2010	11.34.18	II/IV	-8"	37.9	36.1
17/02/2010	13.50.19	I/IV	-8"	32.3	26.8
18/02/2010	0.40.58	II/III	-3"	-56.4	-55.6
19/02/2010	1.24.03	I/III	-4"	-52.1	-50.0
19/02/2010	4.27.05	I/II	-3"	-22.6	-18.5
20/02/2010	11.58.16	I/II	1"	38.5	36.6
22/02/2010	2.11.59	I/III	4"	-44.2	-41.8
22/02/2010	12.40.47	II/III	5"	37.1	35.1
22/02/2010	17.38.52	I/II	-3"	-5.4	-9.3
24/02/2010	1.17.01	I/II	1"	-50.8	-49.4
25/02/2010	4.44.17	II/III	-3"	-15.7	-13.7

Date	time	Moons	Dist."	h	h S
25/02/2010	16.56.11	I/IV	9"	1.3	-0.1
26/02/2010	1.12.18	III/IV	11"	-50.5	-49.3
26/02/2010	4.30.09	I/III	-5"	-17.7	-16.1
26/02/2010	6.50.38	I/II	-3"	8.2	9.7
26/02/2010	11.47.24	I/IV	6"	38.9	39.1
26/02/2010	18.55.51	I/IV	7"	-21.7	-22.6
27/02/2010	14.37.10	I/II	1"	23.4	23.3
01/03/2010	5.21.39	I/III	5"	-6.2	-5.6
01/03/2010	16.16.10	II/III	5"	6.3	7.5
03/03/2010	3.57.48	I/II	1"	-20.6	-20.6
04/03/2010	8.55.05	II/III	-3"	30.4	30.9
05/03/2010	7.33.14	I/III	-6"	19.3	19.0
06/03/2010	17.20.22	I/II	1"	-8.1	-2.7
06/03/2010	22.24.22	II/IV	-9"	-55.0	-51.2
07/03/2010	0.17.06	I/IV	-9"	-52.7	-51.5
07/03/2010	19.09.58	III/IV	-9"	-28.7	-23.1
08/03/2010	8.37.41	I/III	5"	30.1	30.0
10/03/2010	6.43.48	I/II	1"	14.0	12.2
11/03/2010	13.17.11	II/III	-3"	30.2	37.4
12/03/2010	10.34.14	I/III	-6"	40.2	43.5
13/03/2010	14.39.31	III/IV	10"	17.4	26.7
13/03/2010	20.10.04	I/II	1"	-41.5	-32.0
15/03/2010	12.03.39	I/III	5"	37.1	44.9
15/03/2010	15.31.06	II/IV	10"	7.7	18.6
17/03/2010	9.38.12	I/II	1"	39.1	40.9
17/03/2010	22.59.42	I/II	0"	-54.7	-48.8
18/03/2010	2.53.33	I/II	1"	-23.1	-27.1
18/03/2010	17.59.13	II/III	-3"	-21.3	-7.9
19/03/2010	18.17.26	II/III	-3"	-25.1	-11.0
20/03/2010	5.12.49	II/III	-3"	4.1	-0.7
20/03/2010	23.11.17	I/II	1"	-53.4	-47.9
21/03/2010	10.06.37	I/II	0"	41.0	45.2
21/03/2010	17.06.11	I/II	1"	-13.0	2.9
22/03/2010	15.50.06	I/III	5"	1.1	16.9
23/03/2010	3.55.23	I/III	3"	-8.5	-14.7
23/03/2010	6.15.34	I/IV	-11"	16.8	11.3
23/03/2010	13.58.09	I/III	5"	19.8	35.7
24/03/2010	8.02.59	II/IV	-9"	33.1	30.4
24/03/2010	12.49.21	I/II	1"	29.7	44.7
24/03/2010	21.35.19	I/II	0"	-53.7	-40.6
25/03/2010	6.51.59	I/II	2"	23.8	18.5
25/03/2010	23.21.54	II/III	-3"	-50.9	-45.9
27/03/2010	11.15.09	II/III	-3"	39.0	50.7
28/03/2010	2.40.25	I/III	1"	-19.3	-25.8
28/03/2010	8.59.12	I/II	0"	39.8	40.3
28/03/2010	20.29.18	I/II	2"	-49.0	-31.0
29/03/2010	20.50.17	I/III	4"	-51.3	-33.6
30/03/2010	1.20.13	I/III	3"	-32.4	-36.4
30/03/2010	17.56.22	I/III	6"	-26.7	-4.7
30/03/2010	23.39.21	II/IV	11"	-47.0	-43.7
31/03/2010	9.44.05	I/IV	11"	42.0	47.0
31/03/2010	17.04.13	I/II	1"	-17.7	5.3
31/03/2010	19.57.11	I/II	0"	-46.1	-25.4
01/04/2010	0.56.33	I/IV	8"	-35.2	-38.3
01/04/2010	4.01.37	II/IV	8"	-0.9	-10.7
01/04/2010	9.59.46	I/II	2"	42.0	48.9
01/04/2010	12.25.47	I/IV	10"	30.2	49.5
01/04/2010	22.01.16	II/IV	9"	-53.7	-40.3
02/04/2010	0.34.30	III/IV	12"	-38.2	-39.9
03/04/2010	16.08.26	II/III	-4"	-8.9	16.1
04/04/2010	23.27.28	I/II	2"	-46.2	-42.0
06/04/2010	21.25.46	I/III	7"	-53.4	-35.4
07/04/2010	21.13.00	III/IV	-12"	-53.2	-33.7
08/04/2010	12.51.35	I/II	3"	23.7	49.1
08/04/2010	15.31.10	II/IV	-13"	-4.4	23.9
09/04/2010	16.39.18	I/IV	-13"	-17.7	11.6
10/04/2010	20.34.24	II/III	-5"	-51.8	-28.1
12/04/2010	2.14.24	I/II	3"	-14.7	-24.6
13/04/2010	13.38.02	II/III	9"	13.6	44.2
14/04/2010	0.42.09	I/III	7"	-30.0	-34.8
15/04/2010	15.34.51	I/II	3"	-8.9	24.6
17/04/2010	7.50.38	II/IV	15"	41.0	36.1
17/04/2010	11.55.11	III/IV	18"	28.6	57.1
18/04/2010	0.45.22	II/III	-5"	-27.0	-33.1
19/04/2010	4.54.30	I/II	3"	18.9	4.5
20/04/2010	17.09.14	I/III	9"	-28.5	8.2
21/04/2010	3.50.08	I/III	8"	8.9	-6.6
22/04/2010	18.12.27	I/II	4"	-39.6	-2.4
24/04/2010	4.29.58	I/III	-9"	17.7	1.6
25/04/2010	4.46.35	II/III	-6"	21.1	4.7

Date	time	Moons	Dist."	h	h S
26/04/2010	1.20.16	II/IV	-16"	-15.8	-27.0
26/04/2010	7.29.53	I/II	4"	42.2	34.8
27/04/2010	5.53.14	III/IV	-16"	32.5	17.3
27/04/2010	20.39.35	II/III	10"	-51.6	-24.2
28/04/2010	6.52.45	I/III	9"	39.9	28.5
29/04/2010	20.45.58	I/II	4"	-51.1	-24.5
01/05/2010	7.33.14	I/III	-9"	43.7	36.6
02/05/2010	8.40.14	II/III	-7"	44.2	48.5
03/05/2010	2.24.58	III/IV	15"	1.2	-16.9
03/05/2010	10.01.40	I/II	4"	37.9	60.0
04/05/2010	2.10.16	I/IV	15"	-0.6	-18.6
04/05/2010	14.57.15	I/IV	11"	-12.1	35.0
05/05/2010	0.08.34	II/III	11"	-23.1	-30.2
05/05/2010	4.55.07	I/IV	14"	28.2	8.4
05/05/2010	9.51.11	I/III	10"	38.5	59.4
06/05/2010	23.16.14	I/II	5"	-30.8	-31.3
08/05/2010	10.41.02	I/III	-9"	31.0	64.4
09/05/2010	12.28.19	II/III	-7"	12.8	60.1
10/05/2010	12.30.29	I/II	5"	11.9	60.0
12/05/2010	3.36.18	II/III	11"	19.4	-3.7
13/05/2010	8.31.24	I/IV	-17"	43.7	49.2
13/05/2010	11.38.18	II/IV	-17"	19.5	65.6
14/05/2010	1.43.47	I/II	5"	0.7	-19.6
15/05/2010	13.55.31	I/III	-9"	-6.7	47.9
16/05/2010	16.10.44	II/III	-8"	-31.3	23.3
17/05/2010	14.56.47	I/II	6"	-19.0	37.1
19/05/2010	7.02.48	II/III	12"	45.8	34.1
21/05/2010	4.08.56	I/II	6"	30.0	3.2
22/05/2010	4.04.14	I/IV	17"	29.8	2.5
22/05/2010	10.23.21	III/IV	20"	27.5	66.4
22/05/2010	17.23.17	I/III	-8"	-43.9	11.0
23/05/2010	7.51.47	I/III	-5"	44.8	43.6
23/05/2010	15.12.32	I/III	-8"	-25.0	35.0
23/05/2010	19.48.33	II/III	-9"	-48.5	-12.2
24/05/2010	17.20.47	I/II	13"	-44.2	11.7
26/05/2010	10.27.56	II/III	6"	24.8	67.4
28/05/2010	6.31.52	I/II	6"	46.3	29.3
28/05/2010	7.48.24	III/IV	-16"	44.2	43.4
28/05/2010	22.50.05	II/IV	-15"	-21.9	-26.3
29/05/2010	13.55.20	I/IV	-19"	-14.6	49.9
29/05/2010	21.22.34	I/III	-8"	-35.6	-21.7
30/05/2010	19.20.58	I/III	-9"	-48.3	-7.3
30/05/2010	19.33.58	II/IV	-15"	-47.5	-9.1
30/05/2010	23.21.46	II/III	-10"	-14.9	-26.1
31/05/2010	19.42.40	I/II	7"	-46.6	-10.2
02/06/2010	2.32.30	I/II	-8"	21.4	-10.7
02/06/2010	13.51.50	II/III	13"	-16.3	51.0
04/06/2010	8.52.46	I/II	7"	35.1	55.3
05/06/2010	15.40.47	I/II	-8"	-36.1	31.3
06/06/2010	10.30.38	II/IV	20"	18.4	68.9
06/06/2010	17.32.40	I/IV	19"	-48.0	11.2
06/06/2010	20.34.11	III/IV	27"	-38.3	-15.9
06/06/2010	22.46.31	I/III	-11"	-16.7	-25.1
07/06/2010	2.50.57	II/III	-11"	27.5	-7.8
07/06/2010	6.13.12	I/IV	14"	47.0	26.3
07/06/2010	20.15.05	I/IV	18"	-40.3	-13.6
07/06/2010	22.02.32	I/II	7"	-23.8	-23.3
09/06/2010	4.48.50	I/II	-8"	43.7	11.3
09/06/2010	17.13.40	II/III	14"	-47.4	14.8
10/06/2010	0.08.26	I/III	14"	0.9	-23.7
11/06/2010	11.11.40	I/II	8"	8.1	71.1
12/06/2010	17.56.39	I/II	-8"	-48.8	7.6
14/06/2010	1.54.48	I/III	-12"	22.4	-14.8
14/06/2010	6.16.27	II/III	-12"	46.8	27.0
15/06/2010	0.20.27	I/II	8"	6.2	-22.9
15/06/2010	23.30.44	I/IV	-21"	-1.8	-24.6
16/06/2010	7.04.12	I/II	-8"	43.4	35.8
16/06/2010	13.56.11	III/IV	-25"	-25.1	51.4
16/06/2010	20.33.41	II/III	14"	-33.0	-15.1
17/06/2010	2.55.32	I/III	14"	33.9	-6.9
18/06/2010	13.28.38	I/II	8"	-21.5	56.3
19/06/2010	20.11.31	I/II	-8"	-34.6	-12.3
21/06/2010	4.52.42	I/III	-13"	47.0	11.8
21/06/2010	9.37.57	II/III	-13"	18.9	62.8
22/06/2010	2.36.25	I/II	9"	33.9	-9.7
22/06/2010	11.21.20	III/IV	19"	-0.1	71.4
23/06/2010	9.18.32	I/II	-8"	21.1	59.7
23/06/2010	18.45.33	I/IV	25"	-43.5	0.6
23/06/2010	23.51.15	II/III	15"	6.9	-24.1
24/06/2010	5.41.39	I/III	14"	47.2	20.0

Date	time	Moons	Dist."	h	h S
25/06/2010	15.43.39	I/II	9"	-44.3	32.0
26/06/2010	22.25.20	I/II	-9"	-7.2	-23.7
28/06/2010	7.43.48	I/III	-14"	33.6	42.6
28/06/2010	12.55.55	II/III	-14"	-21.9	61.9
29/06/2010	4.50.28	I/II	9"	47.8	11.0
30/06/2010	11.31.47	I/II	-9"	-8.0	70.9
01/07/2010	3.06.29	II/III	15"	42.1	-6.0
01/07/2010	8.27.22	I/III	15"	25.0	50.3
01/07/2010	23.26.17	III/IV	-31"	7.8	-24.9
02/07/2010	4.20.11	I/IV	-25"	47.6	5.7
02/07/2010	11.41.31	II/IV	-26"	-11.1	70.3
02/07/2010	17.56.45	I/II	10"	-44.8	8.2
04/07/2010	0.38.00	I/II	-9"	22.0	-22.4
05/07/2010	10.29.05	I/III	-16"	0.8	68.4
05/07/2010	16.09.36	II/III	-15"	-47.8	27.2
06/07/2010	7.02.37	I/II	10"	35.5	34.3
07/07/2010	13.43.51	I/II	-9"	-34.8	53.8
08/07/2010	6.19.22	II/III	16"	40.2	26.2
08/07/2010	11.13.22	I/III	15"	-10.0	70.4
09/07/2010	20.07.57	I/II	10"	-23.0	-12.3
10/07/2010	7.15.30	I/IV	24"	31.4	36.3
10/07/2010	23.35.56	I/IV	17"	15.8	-25.7
11/07/2010	2.49.29	I/II	-9"	44.3	-9.4
11/07/2010	3.52.12	II/IV	27"	47.9	0.6
11/07/2010	9.40.14	I/IV	22"	5.5	61.5
11/07/2010	16.18.23	III/IV	30"	-47.9	25.3
12/07/2010	13.09.56	I/III	-17"	-32.5	59.1
12/07/2010	19.19.19	II/III	-16"	-29.2	-5.7
13/07/2010	9.12.49	I/II	11"	9.1	57.0
14/07/2010	15.54.42	I/II	-9"	-48.0	29.5
15/07/2010	9.29.48	II/III	16"	4.7	59.4
15/07/2010	14.00.23	I/III	15"	-40.9	50.4
16/07/2010	22.17.11	I/II	11"	5.6	-25.2
17/07/2010	13.50.52	III/IV	-22"	-40.7	51.9
18/07/2010	4.59.42	I/II	-9"	44.7	10.7
19/07/2010	13.07.22	I/IV	-26"	-36.0	58.8
19/07/2010	15.46.43	I/III	-18"	-47.9	30.6
19/07/2010	20.00.25	II/IV	-26"	-17.6	-12.4
19/07/2010	22.24.49	II/III	-17"	9.2	-26.1
20/07/2010	11.21.06	I/II	11"	-19.5	68.6
21/07/2010	18.04.17	I/II	-9"	-35.4	5.6
22/07/2010	12.38.00	II/III	17"	-33.5	62.5
22/07/2010	16.50.03	I/III	15"	-43.8	18.6
24/07/2010	0.24.32	I/II	12"	32.5	-26.3
25/07/2010	7.08.40	I/II	-9"	23.0	33.3
26/07/2010	12.44.02	II/IV	24"	-36.6	61.0
26/07/2010	18.20.08	I/III	-19"	-30.0	2.3
27/07/2010	0.46.39	III/IV	37"	37.3	-25.5
27/07/2010	1.26.23	II/III	-18"	42.2	-22.0
27/07/2010	4.16.52	II/IV	18"	45.3	2.2
27/07/2010	13.27.30	I/II	12"	-42.5	54.4
28/07/2010	10.09.15	II/IV	23"	-12.3	62.7
28/07/2010	20.12.37	I/II	-9"	-9.0	-15.6
29/07/2010	15.43.12	II/III	17"	-46.8	29.9
29/07/2010	19.43.45	I/III	14"	-13.6	-11.8
31/07/2010	2.30.00	I/II	12"	47.7	-15.3
01/08/2010	9.16.23	I/II	-9"	-5.5	54.7
03/08/2010	4.24.21	II/III	-19"	41.8	2.4
03/08/2010	15.32.03	I/II	12"	-46.3	31.2
04/08/2010	0.53.41	II/IV	-29"	42.0	-26.8
04/08/2010	17.19.39	I/IV	-30"	-33.8	11.2
04/08/2010	22.19.41	I/II	-9"	19.6	-29.4
05/08/2010	17.02.32	III/IV	-34"	-35.8	14.1
05/08/2010	18.45.57	II/III	17"	-18.9	-4.0
05/08/2010	22.46.24	I/III	14"	24.9	-30.8
06/08/2010	11.52.04	I/III	8"	-35.7	63.6
06/08/2010	20.41.37	I/III	13"	3.3	-21.3
07/08/2010	4.33.40	I/II	13"	38.6	3.3
08/08/2010	11.22.52	I/II	-9"	-32.6	64.1
10/08/2010	7.18.34	II/III	-20"	9.5	32.7
10/08/2010	17.34.51	I/II	13"	-27.7	7.2
11/08/2010	13.51.32	III/IV	25"	-48.2	47.4
12/08/2010	0.25.35	I/II	-9"	42.4	-30.8
12/08/2010	15.38.57	II/IV	33"	-42.8	28.1
12/08/2010	19.24.07	I/IV	30"	-6.9	-12.0
12/08/2010	21.45.48	II/III	17"	19.3	-29.5
13/08/2010	2.09.08	I/III	13"	47.7	-20.8
13/08/2010	10.40.33	I/III	9"	-29.3	61.5
14/08/2010	0.02.32	I/III	14"	40.7	-32.6
14/08/2010	6.35.37	I/II	13"	14.2	24.2
15/08/2010	13.28.15	I/II	-9"	-48.1	50.1
17/08/2010	10.09.41	II/III	-21"	-27.1	58.0
17/08/2010	19.35.59	I/II	13"	-0.2	-15.2
19/08/2010	2.30.26	I/II	-9"	45.6	-19.3
20/08/2010	0.43.21	II/III	17"	46.2	-31.9
20/08/2010	22.06.04	I/IV	-28"	28.2	-33.5
21/08/2010	0.43.59	III/IV	-40"	46.4	-32.1

Date	time	Moons	Dist."	h	h S
21/08/2010	2.57.52	I/III	16"	42.6	-15.7
21/08/2010	7.34.08	II/IV	-34"	-1.6	33.7
21/08/2010	8.36.01	I/II	13"	-13.8	44.3
22/08/2010	0.31.17	I/IV	-27"	46.0	-33.4
22/08/2010	15.32.40	I/II	-9"	-38.8	26.7
24/08/2010	12.57.24	II/III	-21"	-48.6	51.7
24/08/2010	21.35.42	I/II	14"	25.9	-32.5
26/08/2010	4.34.27	I/II	-9"	26.1	0.3
27/08/2010	3.39.10	II/III	17"	34.0	-10.2
28/08/2010	5.40.39	I/III	17"	13.0	11.6
28/08/2010	10.35.05	I/II	14"	-38.5	56.6
29/08/2010	17.36.24	I/II	-9"	-13.9	2.1
29/08/2010	23.06.24	II/IV	34"	41.5	-38.9
30/08/2010	3.13.43	I/IV	31"	35.7	-15.1
30/08/2010	16.25.06	III/IV	36"	-25.7	14.8
31/08/2010	15.42.31	II/III	-22"	-32.0	22.4
31/08/2010	23.34.10	I/II	14"	44.6	-39.4
02/09/2010	6.37.55	I/II	-9"	-1.0	21.3
03/09/2010	6.33.54	II/III	16"	-1.1	20.4
04/09/2010	8.15.30	I/III	18"	-21.4	38.0
04/09/2010	12.33.02	I/II	14"	-49.2	50.7
05/09/2010	12.39.14	III/IV	-27"	-49.0	49.7
05/09/2010	19.39.42	I/II	-9"	14.4	-21.7
07/09/2010	4.55.29	I/IV	-32"	13.0	1.7
07/09/2010	8.52.23	I/III	-20"	-30.0	42.9
07/09/2010	14.47.57	II/IV	-32"	-36.0	30.0
07/09/2010	18.25.18	II/III	-22"	2.5	-9.9
08/09/2010	1.31.42	I/II	14"	42.6	-32.4
09/09/2010	8.41.09	I/II	-8"	-29.7	40.7
10/09/2010	9.28.39	II/III	16"	-37.7	46.7
11/09/2010	10.45.31	I/III	18"	-46.9	52.2
11/09/2010	14.30.13	I/II	14"	-36.2	31.6
12/09/2010	21.43.01	I/II	-8"	38.3	-40.2
14/09/2010	11.13.27	I/III	-20"	-49.3	51.3
14/09/2010	21.06.36	II/III	-22"	34.7	-37.2
14/09/2010	23.22.32	III/IV	41"	46.1	-44.7
15/09/2010	3.28.36	I/II	14"	21.8	-16.0
15/09/2010	6.32.32	I/IV	33"	-11.9	17.8
16/09/2010	5.00.09	II/IV	28"	4.7	0.9
16/09/2010	10.44.39	I/II	-8"	-48.6	50.3
17/09/2010	12.23.28	II/III	15"	-47.8	46.6
18/09/2010	13.11.42	I/III	19"	-42.9	40.9
18/09/2010	16.26.56	I/II	14"	-11.2	8.5
19/09/2010	23.46.50	I/II	-8"	45.4	-45.8
21/09/2010	13.35.07	I/III	-19"	-38.2	36.7
21/09/2010	23.47.24	II/III	-22"	44.9	-46.5
22/09/2010	5.25.14	I/II	14"	-5.3	4.2
22/09/2010	19.04.31	II/IV	-29"	20.7	-21.7
23/09/2010	8.14.22	I/IV	-31"	-35.8	33.2
23/09/2010	12.48.53	I/II	-8"	-43.2	41.7
24/09/2010	9.03.23	II/IV	-18"	-43.1	39.6
24/09/2010	12.14.57	II/IV	-19"	-46.4	44.6
24/09/2010	14.50.52	III/IV	-35"	-24.0	23.7
24/09/2010	15.20.09	II/III	15"	-18.8	18.6
25/09/2010	15.35.51	I/III	19"	-15.2	15.5
25/09/2010	18.23.37	I/II	14"	15.8	-15.5
27/09/2010	1.51.42	I/II	-7"	28.5	-34.7
28/09/2010	15.58.07	I/III	-18"	-8.7	10.5
29/09/2010	2.28.17	II/III	-22"	21.0	-29.4
29/09/2010	7.22.01	I/II	14"	-31.9	23.4
30/09/2010	10.07.05	III/IV	28"	-50.3	43.5
30/09/2010	14.54.30	I/II	-7"	-18.9	21.0
01/10/2010	8.57.19	II/IV	33"	-46.1	36.7
01/10/2010	10.28.38	I/IV	29"	-50.6	44.2
01/10/2010	18.19.10	I/III	14"	19.4	-16.6
02/10/2010	1.38.20	I/IV	20"	26.9	-38.0
02/10/2010	12.55.41	I/IV	26"	-37.3	37.5
02/10/2010	17.58.43	I/III	19"	16.6	-13.2
02/10/2010	20.20.34	I/II	13"	38.1	-37.7
04/10/2010	3.58.19	I/II	-7"	1.0	-14.5
05/10/2010	18.23.45	I/III	-18"	23.0	-18.7
06/10/2010	5.10.19	I/III	-21"	-14.5	-0.8
06/10/2010	9.19.15	I/II	13"	-49.7	37.6
07/10/2010	17.02.11	I/II	-6"	10.3	-4.1
08/10/2010	21.22.19	II/III	13"	44.6	-48.1
09/10/2010	20.21.25	I/III	19"	41.0	-40.2
09/10/2010	22.00.05	III/IV	-39"	44.9	-52.2
09/10/2010	22.18.10	I/II	13"	44.4	-53.4
10/10/2010	0.27.45	II/IV	-32"	32.0	-49.5
10/10/2010	15.43.01	I/IV	-28"	-1.3	9.4
11/10/2010	6.07.22	I/II	-6"	-28.7	7.9
12/10/2010	20.52.33	I/III	-16"	43.9	-45.8
14/10/2010	19.12.48	I/II	-6"	35.8	-30.4
16/10/2010	0.31.41	II/III	12"	27.3	-50.9
16/10/2010	22.44.51	I/III	18"	40.4	-57.0
18/10/2010	8.19.55	I/II	-6"	-49.8	27.1
18/10/2010	16.02.26	II/IV	31"	7.8	3.7

Date	time	Moons	Dist."	h	h S
18/10/2010	17.37.22	I/IV	29"	24.3	-14.0
19/10/2010	13.24.38	III/IV	31"	-20.7	27.9
19/10/2010	23.26.23	I/III	-15"	34.1	-57.6
21/10/2010	21.27.28	I/II	-5"	43.9	-53.3
23/10/2010	3.49.45	II/III	11"	-13.7	-20.0
24/10/2010	1.09.34	I/III	18"	15.1	-48.0
25/10/2010	8.54.10	III/IV	-25"	-51.5	29.1
25/10/2010	10.37.08	I/II	-5"	-43.5	35.7
26/10/2010	19.24.25	I/IV	-28"	41.7	-35.7
27/10/2010	2.06.40	I/III	-14"	2.6	-39.5
27/10/2010	7.56.44	II/IV	-28"	-50.9	21.5
28/10/2010	23.47.36	I/II	-5"	25.2	-59.2
30/10/2010	7.20.45	II/III	10"	-49.6	15.6
31/10/2010	13.05.36	II/III	6"	-15.2	26.4
31/10/2010	15.35.28	II/III	6"	12.6	4.9
01/11/2010	13.00.57	I/II	-4"	-15.3	26.6
02/11/2010	2.45.03	I/II	-2"	-9.7	-33.9
02/11/2010	6.02.18	I/II	-3"	-42.8	2.4
03/11/2010	4.56.50	I/III	-13"	-33.8	-9.8
03/11/2010	21.07.53	III/IV	35"	41.7	-54.6
03/11/2010	21.15.03	I/IV	27"	41.1	-55.6
03/11/2010	21.49.43	I/III	-8"	37.8	-59.7
04/11/2010	1.46.50	I/III	-10"	0.2	-44.6
04/11/2010	22.57.01	II/IV	24"	28.4	-63.6
05/11/2010	2.15.50	I/II	-4"	-6.5	-39.8
05/11/2010	19.55.53	I/II	-4"	44.2	-43.5
06/11/2010	11.09.27	II/III	9"	-31.4	31.9
07/11/2010	8.55.32	II/III	6"	-48.8	25.5
07/11/2010	22.36.44	II/III	7"	29.6	-64.1
08/11/2010	15.34.59	I/II	-4"	18.1	3.3
09/11/2010	9.31.39	I/II	-4"	-44.1	28.0
10/11/2010	8.03.42	I/III	-11"	-51.3	18.8
11/11/2010	6.06.31	I/III	-11"	-47.6	1.2
11/11/2010	14.06.09	II/IV	-22"	4.5	16.2
12/11/2010	0.05.29	I/IV	-23"	12.3	-61.5
12/11/2010	4.57.25	I/II	-3"	-39.6	-11.6
12/11/2010	22.57.42	I/II	-4"	23.2	-65.9
13/11/2010	2.29.55	I/IV	-21"	-15.2	-38.9
13/11/2010	11.54.59	II/IV	-18"	-18.5	28.5
13/11/2010	13.16.51	III/IV	-27"	-2.9	21.8
13/11/2010	15.31.58	II/III	8"	21.0	2.9
14/11/2010	6.46.10	II/III	6"	-51.3	6.8
15/11/2010	3.09.55	II/III	7"	-23.9	-31.9
15/11/2010	18.28.21	I/II	-3"	43.1	-29.2
16/11/2010	1.25.32	I/II	-1"	-5.5	-50.8
16/11/2010	12.20.51	I/II	-5"	-11.6	26.2
17/11/2010	11.49.19	I/III	-9"	-16.6	27.8
17/11/2010	18.40.26	I/III	-7"	43.8	-31.7
18/11/2010	9.27.33	I/III	-12"	-39.9	25.4
19/11/2010	8.10.59	I/II	-2"	-46.8	17.6
19/11/2010	8.28.51	III/IV	23"	-46.8	19.7
19/11/2010	13.02.29	I/II	-1"	-0.8	22.1
20/11/2010	1.40.04	I/II	-5"	-11.1	-49.1
20/11/2010	3.45.48	II/IV	25"	-33.4	-26.2
20/11/2010	21.39.58	II/III	7"	30.3	-62.4
21/11/2010	3.26.46	II/III	6"	-30.9	-29.9
21/11/2010	5.41.42	I/IV	23"	-49.0	-5.5
22/11/2010	7.14.14	II/III	8"	-51.4	9.3
23/11/2010	14.58.31	I/II	-5"	22.0	6.7
25/11/2010	12.33.16	I/III	-12"	-1.9	23.6
27/11/2010	4.14.42	I/II	-5"	-41.8	-22.1
28/11/2010	19.34.03	II/IV	-25"	41.3	-42.5
28/11/2010	22.09.09	III/IV	-30"	21.0	-66.8
29/11/2010	8.04.59	I/IV	-23"	-45.0	14.8
29/11/2010	11.06.23	II/III	8"	-15.9	26.5
30/11/2010	17.30.45	I/II	-5"	43.2	-19.8
02/12/2010	4.18.38	II/II	-16"	-44.7	-22.2
02/12/2010	15.31.22	I/III	-12"	32.4	1.1
04/12/2010	6.45.20	I/II	-5"	-50.4	2.9
05/12/2010	16.27.30	I/III	14"	40.3	-8.7
06/12/2010	14.52.34	II/II	8"	29.1	6.7
07/12/2010	20.00.05	I/II	-5"	35.3	-47.3
08/12/2010	14.38.27	III/IV	24"	28.1	8.6
09/12/2010	7.27.53	II/III	-15"	-44.8	8.3
09/12/2010	18.25.58	I/III	-13"	43.3	-29.9
11/12/2010	9.13.51	I/II	-5"	-27.8	20.1
12/12/2010	19.11.49	I/III	13"	38.9	-38.3
13/12/2010	18.35.17	II/II	8"	41.9	-31.5
14/12/2010	10.51.57	III/IV	-20"	-8.0	24.7
14/12/2010	22.27.51	I/II	-6"	7.6	-69.6
15/12/2010	13.00.46	I/IV	-21"	16.4	19.7
16/12/2010	4.38.48	II/IV	-22"	-50.4	-20.5
16/12/2010	10.40.17	II/III	-15"	-5.7	24.4
16/12/2010	21.18.27	I/III	-13"	18.6	-60.6
18/12/2010	11.41.05	I/II	-6"	4.2	24.2
19/12/2010	22.00.54	I/III	13"	9.3	-66.6
20/12/2010	22.16.41	II/III	9"	5.9	-68.8

Date	time	Moons	Dist."	h	h S
22/12/2010	0.54.38	I/II	-6"	-24.0	-61.5
23/12/2010	13.55.56	II/III	-14"	30.3	14.4
23/12/2010	17.46.07	I/IV	17"	43.2	-21.7
23/12/2010	23.42.15	I/IV	15"	-12.1	-70.3
24/12/2010	19.22.07	I/IV	20"	32.8	-39.3

Date	time	Moons	Dist."	h	h S
24/12/2010	21.16.07	II/IV	21"	14.3	-59.6
25/12/2010	14.07.37	I/II	-6"	33.1	13.1
27/12/2010	0.54.56	I/III	12"	-26.9	-61.7
28/12/2010	1.56.22	II/III	9"	-37.3	-51.4
29/12/2010	3.20.56	I/II	-6"	-47.8	-36.0

Date	time	Moons	Dist."	h	h S
30/12/2010	17.14.48	II/III	-14"	44.0	-15.3

Date = data  
 Time = orario  
 Moons = lune coinvolte  
 Dist = distanza in secondi  
 H = altitudine di Giove sull'orizzonte  
 H S = altitudine del Sole sull'orizzonte

Date in the format dd/mm/yyyy  
 Dist = distance in seconds  
 H = altitude of Jupiter above the horizon  
 H S = altitude of the Sun above the horizon

I = Io  
 II = Europa  
 III = Ganimede  
 IV = Callisto

TEMPI IN T.U.

Valori negativi delle distanze indicano che il 2° satellite transita a nord dell'altro

TIMES IN U.T.

Negative values of the distances show that the 2nd satellite transits to north of the other

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# OCCULTAZIONI TRA I SATELLITI DI GIOVE

## OCCULTATIONS BETWEEN THE MOONS OF JUPITER

Year	M	D	h	m	s	Event Type	Ph	Dur	dMag	%Ill	Sep	PA	MinD	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	
2010	1	1	18	26	26	(II) occ (I)	P	173	0.1	93.7	73.3	67	0.636				18	24	59		18	26	26		18	27	52					
2010	1	4	0	52	48	(I) occ (II)	P	90	0.0	98.9	57.6	68	0.765				0	52	3		0	52	48		0	53	33					
2010	1	5	7	39	2	(II) occ (I)	P	147	0.0	96.6	74.9	67	0.697				7	37	49		7	39	2		7	40	15					
2010	1	8	20	52	5	(II) occ (I)	P	107	0.0	98.8	76.5	67	0.756				20	51	11		20	52	5		20	52	58					
2010	3	17	22	59	37	(II) occ (I)	P	2675	0.4	69.2	45.2	243	0.233				22	37	20		22	59	37		23	21	54					
2010	3	21	10	6	45	(II) occ (I)	P	1873	0.6	59.6	19.5	239	0.102				9	51	8		10	6	45		10	22	21					
2010	3	21	11	24	33	(II) ecl (I)	P	2614	0.7	54.0	37.4	242	0.349		11	2	46	11	6	17		11	24	33		11	42	49	11	46	20	
2010	3	24	21	35	28	(II) occ (I)	P	1763	0.6	57.7	3.5	102	0.066				21	20	46		21	35	28		21	50	10					
2010	3	24	22	49	29	(II) ecl (I)	P	2009	1.0	38.5	15.3	237	0.204		22	32	45	22	35	6		22	49	29		23	3	53	23	6	14	
2010	3	28	8	59	20	(II) occ (I)	P	1979	0.6	59.0	26.2	69	0.092				8	42	51		8	59	20		9	15	49					
2010	3	28	10	24	45	(II) ecl (I)	P	1875	1.2	31.9	6.0	86	0.139		10	9	7	10	11	14		10	24	45		10	38	15	10	40	22	
2010	3	31	17	5	49	(II) occ (I)	P	2144	0.1	92.3	82.9	66	0.584				16	47	57		17	5	49		17	23	41					
2010	3	31	19	57	47	(II) occ (I)	P	3445	0.4	68.2	53.4	67	0.223				19	29	5		19	57	47		20	26	30					
2010	3	31	22	4	4	(II) ecl (I)	A	1972	1.2	34.1	25.3	70	0.134		21	47	38	21	49	53	22	3	31	22	4	4	22	18	15	22	20	30
2010	4	4	4	41	6	(II) ecl (I)	E	871	0.0	99.3	92.7	65	0.936		4	33	50					4	41	6					4	48	22	
2010	4	4	9	30	1	(II) ecl (I)	P	2497	1.1	37.9	46.9	67	0.199		9	9	12	9	12	13		9	30	1		9	47	49	9	50	50	
2010	4	7	19	51	18*	(II) ecl (I)	P	2736	0.2	82.8	77.1	66	0.647		19	28	30	19	34	24		19	51	18		20	8	11	20	14	6	

Ore in T.U.

Legenda :

Data nel formato mese/giorno, un asterisco indica che le lune si avvicinano ma non si occultano  
 Event type : tipo di evento, eclissi o occultazione  
 Ph : fenomeno, M=mancato, E=eclisse penombrale, P=eclisse/occultazione parziale, T=eclisse/occultazione totale, A=eclisse/occultazione anulare  
 Durn : durata in secondi  
 dMag : caduta di luce in magnitudini  
 %ill : cambio in illuminazione, rispetto alla illuminazione intera, della luna rimanente (occultazione) o di entrambe (eclissi)  
 Sep : distanza in " tra satellite occultato/eclissato e centro del pianeta  
 Pa : angolo di posizione tra satellite occultato/eclissato e pianeta  
 MinD : distanza minima tra i centri delle lune o tra la luna e l'ombra  
 T1-T7 : inizio/fine della fase di contatto con la penombra  
 T2-T6 : inizio/fine della fase di contatto con l'ombra o tra i lembi delle lune  
 T3-T5 : inizio/fine della fase di totalità  
 Tmax : tempo di metà evento

Times in U.T.

Date in the format month/day, an asterisk shows that the moons are near but they don't occult  
 Event type : eclipse or occultation  
 Ph : phenomenon, M=missed, E=penumbral eclipse, P=partial eclipse/occultation, T=total eclipse/occultation, A=annular eclipse/occultation  
 Durn : duration in seconds  
 dMag : difference magnitude  
 %ill : defect of illumination, respect to integer  
 Sep : distance in " between the satellite and the center of the planet  
 Pa : position angle between the satellite and the center of the planet  
 MinD : least distance between the satellites  
 T1-T7 : penumbral phase begins/ends  
 T2-T6 : umbra phase begins/ends  
 T3-T5 : totalità phase begins/ends  
 Tmax : middle time of the event

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# CONGIUNZIONI ED ELONGAZIONI DEI SATELLITI DI GIOVE

## CONJUNCTIONS AND ELONGATIONS OF THE SATELLITES OF JUPITER

I Congiunzione superiore - Superior conjunction

Date	Time	h	h S
01/01/2010	13.03.43	31.5	20.4
03/01/2010	7.34.04	-17.1	7.4
05/01/2010	2.04.22	-61.3	-50.3
06/01/2010	20.34.45	-13.9	-50.8
08/01/2010	15.05.05	33.1	7.4
10/01/2010	9.35.32	9	21.7
12/01/2010	4.05.56	-48.6	-27.9
13/01/2010	22.36.25	-39.8	-67.4
15/01/2010	17.06.50	17.7	-11.4
17/01/2010	11.37.23	29.4	27.2
19/01/2010	6.07.52	-23.1	-5.5
21/01/2010	0.38.26	-58.6	-62.8
22/01/2010	19.08.56	-6.4	-32.3
24/01/2010	13.39.33	35.8	21.4
26/01/2010	8.10.06	3.8	14.6
28/01/2010	2.40.43	-52.6	-42.3
29/01/2010	21.11.16	-32.6	-52.6
31/01/2010	15.41.57	23.9	6.5
02/02/2010	10.12.32	26.5	28.9
04/02/2010	4.43.13	-28.8	-18.7
05/02/2010	23.13.48	-54.2	-63.6
07/02/2010	17.44.31	1.3	-13.5
09/02/2010	12.15.09	37.5	32.3
11/02/2010	6.45.52	-1.1	4.9
13/02/2010	1.16.29	-55.2	-52.8
14/02/2010	19.47.13	-25.2	-34.6
16/02/2010	14.17.52	29.5	23
18/02/2010	8.48.35	22.8	25.4
20/02/2010	3.19.13	-34.2	-30.7
21/02/2010	21.49.57	-48.6	-52.1
23/02/2010	16.20.36	8.3	5.4
25/02/2010	10.51.19	38	38.4
27/02/2010	5.21.56	-7.5	-6.2
28/02/2010	23.52.40	-56.2	-55.2
02/03/2010	18.23.18	-17.7	-15.7
04/03/2010	12.54.01	34.6	37.5
06/03/2010	7.24.37	18.5	17.9
08/03/2010	1.55.19	-39.2	-39.9
09/03/2010	20.25.56	-42.3	-35.6
11/03/2010	14.56.37	15.4	23.5
13/03/2010	9.27.10	37.2	38.2
15/03/2010	3.57.51	-13.1	-16.9
16/03/2010	22.28.25	-55.3	-47.9
18/03/2010	16.59.03	-10.2	3.6
20/03/2010	11.29.34	38.9	47.9
22/03/2010	6.00.10	13.6	8.1
24/03/2010	0.30.41	-43.5	-43.7
25/03/2010	19.01.16	-35.5	-17.5
27/03/2010	13.31.43	22.4	40.6
29/03/2010	8.02.15	35.1	32
31/03/2010	2.32.42	-18.8	-26
01/04/2010	21.03.12	-52.6	-34.4

Date	Time	h	h S
03/04/2010	15.33.34	-1.7	22.4
05/04/2010	10.04.02	42	50.8
07/04/2010	4.34.23	8.2	-2.2
08/04/2010	23.04.49	-47.1	-40.5
10/04/2010	17.35.05	-28.2	1.7
12/04/2010	12.05.27	29	54.8
14/04/2010	6.35.43	31.8	21.8
16/04/2010	1.06.02	-24.6	-31.8
17/04/2010	19.36.13	-48.4	-17.9
19/04/2010	14.06.28	5.6	41.1
21/04/2010	8.36.36	43.8	45
23/04/2010	3.06.49	2.4	-13.3
24/04/2010	21.36.52	-49.5	-30.9
26/04/2010	16.07.00	-20.6	20.7
28/04/2010	10.37.01	35.3	61.3
30/04/2010	5.07.05	27.3	9.5
01/05/2010	23.37.00	-30.3	-32.4
03/05/2010	18.07.00	-42.9	0.6
05/05/2010	12.36.52	13.4	58.1
07/05/2010	7.06.48	43.7	33
09/05/2010	1.36.35	-4.2	-21.6
10/05/2010	20.06.25	-50.4	-17
12/05/2010	14.36.08	-12.5	40.1
14/05/2010	9.05.54	40.8	55.1
16/05/2010	3.35.31	21.7	-3
17/05/2010	22.05.11	-35.8	-26.9
19/05/2010	16.34.44	-36.4	19.3
21/05/2010	11.04.19	21.2	68.2
23/05/2010	5.33.46	41.7	18.2
25/05/2010	0.03.14	-11.2	-25.9
26/05/2010	18.32.36	-49.5	0.2
28/05/2010	13.02.00	-4	58.7
30/05/2010	7.31.15	45	40.4
01/06/2010	2.00.32	15.1	-14.9
02/06/2010	20.29.42	-40.9	-15.9
04/06/2010	14.58.53	-29.1	39
06/06/2010	9.27.56	28.9	61.2
08/06/2010	3.57.00	37.7	2.7
09/06/2010	22.25.57	-18.5	-24.2
11/06/2010	16.54.55	-46.5	18.3
13/06/2010	11.23.44	4.7	71.1
15/06/2010	5.52.34	47.3	22.6
17/06/2010	0.21.17	7.7	-22.8
18/06/2010	18.50.01	-45	-0.2
20/06/2010	13.18.36	-21	58.1
22/06/2010	7.47.11	36.1	43.5
24/06/2010	2.15.39	31.9	-12.4
25/06/2010	20.44.09	-25.9	-16
27/06/2010	15.12.29	-41.7	37.8
29/06/2010	9.40.48	13.4	62.8
01/07/2010	4.09.01	47	4
02/07/2010	22.37.15	-0.1	-24.4

Date	Time	h	h S
04/07/2010	17.05.19	-47.5	17.1
06/07/2010	11.33.23	-12.3	70.4
08/07/2010	6.01.19	42.3	22.8
10/07/2010	0.29.16	24.4	-23.6
11/07/2010	18.57.04	-33.3	-1.5
13/07/2010	13.24.51	-35.3	56.6
15/07/2010	7.52.30	22.2	42.6
17/07/2010	2.20.11	43.7	-14.1
18/07/2010	20.47.41	-9.8	-18.1
20/07/2010	15.15.11	-47.7	36.3
22/07/2010	9.42.34	-2.4	60.3
24/07/2010	4.09.57	46.6	1.6
25/07/2010	22.37.11	15.7	-27.8
27/07/2010	17.04.24	-40.2	15.3
29/07/2010	11.31.30	-27.4	66.6
31/07/2010	5.58.36	30.6	19.5
02/08/2010	0.25.33	37.7	-28.2
03/08/2010	18.52.29	-19.2	-4.8
05/08/2010	13.19.19	-45.2	53.9
07/08/2010	7.46.08	6.8	38.3
09/08/2010	2.12.50	47.8	-19.5
10/08/2010	20.39.29	5.8	-22.1
12/08/2010	15.06.03	-45.8	34.1
14/08/2010	9.32.37	-18.5	54.4
16/08/2010	3.59.04	38.1	-4.5
17/08/2010	22.25.29	29.4	-33.6
19/08/2010	16.51.48	-28.8	12.9
21/08/2010	11.18.09	-39.9	60.1
23/08/2010	5.44.22	16.4	13.2
25/08/2010	0.10.34	45.4	-35.6
26/08/2010	18.36.42	-5	-8.1
28/08/2010	13.02.51	-48.8	49.7
30/08/2010	7.28.53	-8.8	31.1
01/09/2010	1.54.55	43.6	-27.4
02/09/2010	20.20.53	19.5	-26.9
04/09/2010	14.46.53	-37.9	31.1
06/09/2010	9.12.48	-32.5	45.9
08/09/2010	3.38.42	25.5	-12.7
09/09/2010	22.04.33	39.4	-40.7
11/09/2010	16.30.27	-16	10.1
13/09/2010	10.56.17	-48.3	51.7
15/09/2010	5.22.08	1.6	5
16/09/2010	23.47.57	45.9	-44.7
18/09/2010	18.13.48	8.8	-11.4
20/09/2010	12.39.38	-45.5	43.9
22/09/2010	7.05.28	-23.6	22.2
24/09/2010	1.31.18	33.6	-36.9
25/09/2010	19.57.11	31.2	-31.5
27/09/2010	14.23.03	-26.6	27.2
29/09/2010	8.48.57	-44.2	36.3
01/10/2010	3.14.52	11.2	-21.8
02/10/2010	21.40.50	44.6	-47.8

Date	Time	h	h S
04/10/2010	16.06.49	-1.6	7
06/10/2010	10.32.50	-50.3	42.4
08/10/2010	4.58.53	-14.1	-3.9
09/10/2010	23.25.01	39.7	-54.1
11/10/2010	17.51.10	21.8	-14.6
13/10/2010	12.17.22	-36.3	37
15/10/2010	6.43.36	-37.4	13.3
17/10/2010	1.09.56	20.4	-46.2
18/10/2010	19.36.18	40.1	-35.6
20/10/2010	14.02.44	-13	22.5
22/10/2010	8.29.13	-51.2	27.1
24/10/2010	2.55.47	-4.3	-30.1
25/10/2010	21.22.25	43.3	-54
27/10/2010	15.49.06	12.1	3.6
29/10/2010	10.15.52	-44.1	33.8
31/10/2010	4.42.43	-29.3	-11.8
01/11/2010	23.09.38	28.8	-62.5
03/11/2010	17.36.37	33.4	-17.7
05/11/2010	12.03.40	-22.7	30.2
07/11/2010	6.30.49	-48.4	5.9
09/11/2010	0.58.03	5.1	-53.7
10/11/2010	19.25.20	44.1	-39
12/11/2010	13.52.42	2.9	17.7
14/11/2010	8.20.11	-49.4	19.8
16/11/2010	2.47.44	-20.6	-36.2
17/11/2010	21.15.20	35.2	-58.6
19/11/2010	15.43.01	26.6	0.5
21/11/2010	10.10.48	-31.2	27.2
23/11/2010	4.38.41	-43	-17
24/11/2010	23.06.36	13.7	-68.6
26/11/2010	17.34.36	42.6	-20.3
28/11/2010	12.02.42	-6.2	25.1
30/11/2010	6.30.53	-51.6	1.4
02/12/2010	0.59.06	-12	-58.2
03/12/2010	19.27.25	40.3	-41.4
05/12/2010	13.55.49	19.3	14.3
07/12/2010	8.24.18	-38.2	15.7
09/12/2010	2.52.49	-36.2	-39.1
10/12/2010	21.21.26	21.7	-61.2
12/12/2010	15.50.06	39.4	-1.6
14/12/2010	10.18.53	-14.1	23.9
16/12/2010	4.47.41	-50.8	-18.9
17/12/2010	23.16.34	-3.1	-71.3
19/12/2010	17.45.31	43.9	-22
21/12/2010	12.14.33	12.2	22.9
23/12/2010	6.43.37	-43.5	0.6
25/12/2010	1.12.45	-28.8	-58.8
26/12/2010	19.41.57	28.9	-42.8
28/12/2010	14.11.14	35.1	13
30/12/2010	8.40.32	-21.1	15.8

I Congiunzione inferiore - Inferior conjunction

Date	Time	h	h S
02/01/2010	10.25.27	12.6	24.1
04/01/2010	4.55.44	-45.1	-18.8
05/01/2010	23.26.00	-44.4	-70.5
07/01/2010	17.56.22	13.4	-21.6
09/01/2010	12.26.40	31.1	24.1
11/01/2010	6.57.02	-19.0	2.3
13/01/2010	1.27.23	-60.4	-56.5
14/01/2010	19.57.49	-11.3	-42.8
16/01/2010	14.28.12	34.3	13.9
18/01/2010	8.58.37	7.4	19.2
20/01/2010	3.29.02	-49.9	-34.3
21/01/2010	21.59.31	-37.2	-61.6
23/01/2010	16.29.57	20.0	-2.9
25/01/2010	11.00.25	28.7	28.9
27/01/2010	5.30.52	-25.0	-11.2
29/01/2010	0.01.24	-57.0	-64.8

Date	Time	h	h S
30/01/2010	18.31.52	-3.4	-23.9
01/02/2010	13.02.22	36.8	26.8
03/02/2010	7.32.51	2.1	10.7
05/02/2010	2.03.24	-53.6	-47.5
06/02/2010	20.33.53	-29.7	-44.6
08/02/2010	15.04.24	26.2	14.2
10/02/2010	9.34.54	25.3	28.1
12/02/2010	4.05.27	-30.8	-24.1
13/02/2010	22.35.58	-52.0	-59.2
15/02/2010	17.06.29	4.1	-4.7
17/02/2010	11.36.59	38.0	36.0
19/02/2010	6.07.32	-3.7	0.5
21/02/2010	0.38.02	-55.7	-54.9
22/02/2010	19.08.33	-22.1	-25.8
24/02/2010	13.39.02	31.8	30.2
26/02/2010	8.09.33	21.2	22.5

Date	Time	h	h S
25/04/2010	18.48.32	-45.4	-8.5
27/04/2010	13.18.25	10.1	50.5
29/04/2010	7.48.17	43.9	38.8
01/05/2010	2.18.07	-1.0	-18.4
02/05/2010	20.47.58	-50.4	-24.0
04/05/2010	15.17.43	-15.8	31.2
06/05/2010	9.47.28	38.6	59.2
08/05/2010	4.17.10	23.9	2.5
09/05/2010	22.46.53	-33.9	-30.3
11/05/2010	17.16.30	-39.1	10.5
13/05/2010	11.46.06	18.2	65.1
15/05/2010	6.15.39	42.6	24.9
17/05/2010	0.45.13	-8.7	-24.8
18/05/2010	19.14.41	-50.2	-8.2
20/05/2010	13.44.08	-7.4	50.6
22/05/2010	8.13.31	43.5	47.4
24/05/2010	2.42.56	17.6	-10.2
25/05/2010	21.12.14	-39.2	-21.5
27/05/2010	15.41.31	-31.9	30.2
29/05/2010	10.10.43	26.1	66.2
31/05/2010	4.39.57	39.3	9.3
01/06/2010	23.09.04	-15.9	-25.9
03/06/2010	17.38.11	-47.9	9.9
05/06/2010	12.07.12	1.6	67.2
07/06/2010	6.36.14	46.6	30.6
09/06/2010	1.05.10	10.4	-20.0
10/06/2010	19.34.05	-43.7	-7.9
12/06/2010	14.02.53	-24.0	49.9
14/06/2010	8.31.43	33.5	51.9
16/06/2010	3.00.26	34.1	-6.2
17/06/2010	21.29.08	-23.3	-20.4
19/06/2010	15.57.43	-43.7	29.2
21/06/2010	10.26.20	10.2	69.0
23/06/2010	4.54.49	47.4	12.1
24/06/2010	23.23.17	2.6	-24.6
26/06/2010	17.51.38	-46.9	9.1

Date	Time	h	h S
28/06/2010	12.20.01	-15.5	66.9
30/06/2010	6.48.16	40.2	32.2
02/07/2010	1.16.30	27.3	-19.3
03/07/2010	19.44.36	-30.7	-8.8
05/07/2010	14.12.44	-37.8	48.7
07/07/2010	8.40.43	19.0	52.2
09/07/2010	3.08.42	45.2	-6.4
10/07/2010	21.36.33	-6.4	-21.8
12/07/2010	16.04.25	-48.0	27.8
14/07/2010	10.32.08	-6.5	67.5
16/07/2010	4.59.51	45.3	11.0
17/07/2010	23.27.26	19.1	-26.9
19/07/2010	17.55.02	-37.7	7.4
21/07/2010	12.22.29	-30.5	64.6
23/07/2010	6.49.56	27.5	30.1
25/07/2010	1.17.14	40.3	-22.5
26/07/2010	19.44.34	-15.6	-11.4
28/07/2010	14.11.45	-46.5	46.8
30/07/2010	8.38.55	3.2	48.9
01/08/2010	3.05.57	47.8	-10.4
02/08/2010	21.33.01	9.8	-25.7
04/08/2010	15.59.56	-43.8	25.8
06/08/2010	10.26.51	-22.0	62.4
08/08/2010	4.53.36	35.4	6.5
09/08/2010	23.20.25	32.9	-32.4
11/08/2010	17.47.04	-25.0	4.8
13/08/2010	12.13.44	-42.3	60.0
15/08/2010	6.40.15	12.6	24.9
17/08/2010	1.06.49	46.9	-29.0
18/08/2010	19.33.15	0.0	-15.1
20/08/2010	13.59.41	-47.9	43.7
22/08/2010	8.25.59	-12.8	42.5
24/08/2010	2.52.21	41.7	-17.2
25/08/2010	21.18.34	23.7	-31.2
27/08/2010	15.44.49	-34.2	23.1
29/08/2010	10.10.56	-35.7	54.6

Date	Time	h	h S
31/08/2010	4.37.07	21.9	-0.1
01/09/2010	23.03.11	42.3	-39.9
03/09/2010	17.29.17	-11.4	1.9
05/09/2010	11.55.16	-48.9	53.4
07/09/2010	6.21.19	-2.4	17.3
09/09/2010	0.47.17	45.4	-37.6
10/09/2010	19.13.17	13.4	-19.1
12/09/2010	13.39.11	-42.5	39.4
14/09/2010	8.05.10	-27.5	34.0
16/09/2010	2.31.04	30.4	-25.8
17/09/2010	20.57.03	35.0	-37.2
19/09/2010	15.22.55	-22.0	19.8
21/09/2010	9.48.55	-46.4	45.3
23/09/2010	4.14.50	7.0	-9.3
24/09/2010	22.40.50	45.7	-48.4
26/09/2010	17.06.45	2.8	-0.8
28/09/2010	11.32.48	-48.5	45.4
30/09/2010	5.58.47	-18.3	8.7
02/10/2010	0.24.53	37.3	-47.2
03/10/2010	18.50.54	26.1	-23.0
05/10/2010	13.17.04	-32.1	33.8
07/10/2010	7.43.12	-40.7	24.8
09/10/2010	2.09.26	16.3	-34.9
10/10/2010	20.35.37	42.5	-42.7
12/10/2010	15.01.58	-8.2	15.8
14/10/2010	9.28.17	-51.2	35.8
16/10/2010	3.54.44	-8.9	-17.6
17/10/2010	22.21.08	42.0	-56.5
19/10/2010	16.47.43	16.6	-5.1
21/10/2010	11.14.17	-40.7	37.1
23/10/2010	5.40.59	-33.2	0.9
25/10/2010	0.07.38	24.8	-56.2
26/10/2010	18.34.29	37.0	-26.7
28/10/2010	13.01.19	-18.2	27.7
30/10/2010	7.28.18	-50.1	16.7
01/11/2010	1.55.15	0.9	-42.5

Date	Time	h	h S
02/11/2010	20.22.24	44.0	-47.4
04/11/2010	14.49.32	7.3	11.4
06/11/2010	9.16.50	-47.2	27.7
08/11/2010	3.44.05	-24.9	-24.2
09/11/2010	22.11.33	32.0	-63.3
11/11/2010	16.39.00	30.3	-8.6
13/11/2010	11.06.37	-27.1	30.0
15/11/2010	5.34.12	-45.9	-5.6
17/11/2010	0.01.58	9.3	-63.1
18/11/2010	18.29.45	43.6	-29.8
20/11/2010	12.57.41	-0.9	22.4
22/11/2010	7.25.36	-50.9	10.9
24/11/2010	1.53.41	-16.5	-47.5
25/11/2010	20.21.47	37.8	-50.8
27/11/2010	14.50.03	23.2	7.6
29/11/2010	9.18.16	-34.7	22.3
01/12/2010	3.46.40	-39.9	-27.9
02/12/2010	22.15.04	17.4	-67.8
04/12/2010	16.43.38	41.3	-11.5
06/12/2010	11.12.09	-9.9	25.5
08/12/2010	5.40.52	-51.6	-8.6
10/12/2010	0.09.34	-8.2	-66.6
11/12/2010	18.38.25	42.1	-32.2
13/12/2010	13.07.14	16.2	19.1
15/12/2010	7.36.13	-40.7	8.7
17/12/2010	2.05.11	-33.1	-48.9
18/12/2010	20.34.19	24.9	-53.0
20/12/2010	15.03.23	37.7	5.4
22/12/2010	9.32.37	-17.1	20.8
24/12/2010	4.01.51	-49.6	-28.0
25/12/2010	22.31.13	0.4	-69.5
27/12/2010	17.00.32	44.9	-13.2
29/12/2010	11.30.00	9.6	24.7
31/12/2010	5.59.28	-45.0	-7.6

I Massima elongazione est - Maxima est elongation

Date	Time	h	h S
01/01/2010	23.45.11	-45.7	-70.0
03/01/2010	18.15.36	12.2	-25.7
05/01/2010	12.45.59	31.4	22.3
07/01/2010	7.16.28	-17.9	5.0
09/01/2010	1.46.51	-60.9	-53.3
10/01/2010	20.17.22	-12.8	-47.1
12/01/2010	14.47.50	33.6	10.5
14/01/2010	9.18.24	8.5	20.7
16/01/2010	3.48.52	-49.1	-30.9
17/01/2010	22.19.27	-38.8	-64.9
19/01/2010	16.49.59	18.6	-7.7
21/01/2010	11.20.37	29.2	28.2
23/01/2010	5.51.08	-23.8	-8.1
25/01/2010	0.21.47	-58.0	-64.0
26/01/2010	18.52.22	-5.4	-28.5
28/01/2010	13.23.02	36.3	24.0
30/01/2010	7.53.36	3.3	13.0
01/02/2010	2.24.17	-52.9	-44.6
02/02/2010	20.54.54	-31.6	-49.0
04/02/2010	15.25.36	24.7	10.0
06/02/2010	9.56.12	26.2	28.8
08/02/2010	4.26.53	-29.4	-21.0
09/02/2010	22.57.31	-53.4	-61.8
11/02/2010	17.28.14	2.2	-9.7
13/02/2010	11.58.50	37.8	34.2
15/02/2010	6.29.32	-1.6	3.2
17/02/2010	1.00.10	-55.3	-53.7
18/02/2010	19.30.53	-24.2	-30.7
20/02/2010	14.01.29	30.4	26.3
22/02/2010	8.32.10	22.5	24.5
24/02/2010	3.02.46	-34.7	-32.6
25/02/2010	21.33.28	-47.8	-48.8
27/02/2010	16.04.02	9.4	9.2
01/03/2010	10.34.41	38.1	39.2
03/03/2010	5.05.16	-8.1	-8.1
04/03/2010	23.35.56	-56.0	-54.1
06/03/2010	18.06.28	-16.6	-11.8
08/03/2010	12.37.05	35.4	40.3
10/03/2010	7.07.37	18.0	16.4
12/03/2010	1.38.14	-39.7	-40.9
13/03/2010	20.08.44	-41.3	-31.8
15/03/2010	14.39.17	16.5	27.3
17/03/2010	9.09.46	37.1	37.6
19/03/2010	3.40.19	-13.8	-18.7
20/03/2010	22.10.45	-54.8	-45.2
22/03/2010	16.41.14	-8.9	7.6

Date	Time	h	h S
24/03/2010	11.11.39	39.6	49.5
26/03/2010	5.42.07	12.9	6.1
28/03/2010	0.12.29	-44.1	-43.4
29/03/2010	18.42.53	-34.2	-13.4
31/03/2010	13.13.13	23.6	44.1
02/04/2010	7.43.36	34.7	30.2
04/04/2010	2.13.53	-19.8	-27.5
05/04/2010	20.44.11	-51.8	-30.8
07/04/2010	15.14.26	-0.2	26.7
09/04/2010	9.44.43	42.6	50.4
11/04/2010	4.14.54	7.2	-5.1
12/04/2010	22.45.06	-47.6	-38.7
14/04/2010	17.15.14	-26.7	6.0
16/04/2010	11.45.25	30.4	57.4
18/04/2010	6.15.29	31.0	19.1
20/04/2010	0.45.34	-25.8	-32.4
21/04/2010	19.15.35	-47.3	-13.8
23/04/2010	13.45.38	7.3	45.3
25/04/2010	8.15.35	44.0	42.6
27/04/2010	2.45.32	1.1	-15.5
28/04/2010	21.15.25	-49.8	-27.9
30/04/2010	15.45.20	-18.7	25.4
02/05/2010	10.15.09	36.7	61.0
04/05/2010	4.44.57	26.1	6.4
05/05/2010	23.14.42	-31.7	-31.6
07/05/2010	17.44.28	-41.4	5.0
09/05/2010	12.14.08	15.3	61.7
11/05/2010	6.43.47	43.4	29.5
13/05/2010	1.13.23	-6.1	-23.2
14/05/2010	19.42.59	-50.3	-13.0
16/05/2010	14.12.30	-10.4	45.0
18/05/2010	8.41.59	42.0	51.8
20/05/2010	3.11.24	20.0	-6.6
21/05/2010	21.40.50	-37.3	-24.5
23/05/2010	16.10.10	-34.5	24.4
25/05/2010	10.39.28	23.4	68.1
27/05/2010	5.08.43	40.8	14.0
28/05/2010	23.37.57	-13.3	-26.1
30/05/2010	18.07.06	-48.9	4.6
01/06/2010	12.36.13	-1.0	63.1
03/06/2010	7.05.16	45.9	35.8
05/06/2010	1.34.18	13.0	-17.5
06/06/2010	20.03.15	-42.2	-12.2
08/06/2010	14.32.09	-26.7	44.3
10/06/2010	9.01.00	31.1	56.9
12/06/2010	3.29.49	36.1	-1.0

Date	Time	h	h S
13/06/2010	21.58.33	-20.7	-22.6
15/06/2010	16.27.14	-45.3	23.6
17/06/2010	10.55.51	7.3	71.1
19/06/2010	5.24.26	47.5	17.5
20/06/2010	23.52.57	5.2	-24.0
22/06/2010	18.21.23	-46.0	4.1
24/06/2010	12.49.46	-18.3	62.2
26/06/2010	7.18.07	38.2	38.0
28/06/2010	1.46.23	29.7	-16.0
29/06/2010	20.14.35	-28.3	-12.6
01/07/2010	14.42.43	-39.9	43.3
03/07/2010	9.10.48	16.2	57.7
05/07/2010	3.38.50	46.3	-0.7
06/07/2010	22.06.46	-3.2	-23.4
08/07/2010	16.34.38	-47.9	22.5
10/07/2010	11.02.28	-9.3	70.0
12/07/2010	5.30.13	44.0	16.8
13/07/2010	23.57.53	21.7	-25.6
15/07/2010	18.25.29	-35.6	2.8
17/07/2010	12.53.02	-32.8	61.2
19/07/2010	7.20.32	25.0	36.3
21/07/2010	1.47.55	42.0	-18.6
22/07/2010	20.15.15	-12.8	-14.9
24/07/2010	14.42.32	-47.2	41.8
26/07/2010	9.09.45	0.7	54.6
28/07/2010	3.36.52	47.4	-4.8
29/07/2010	22.03.56	12.5	-27.0
31/07/2010	16.30.56	-42.2	20.8
02/08/2010	10.57.53	-24.5	65.3
04/08/2010	5.24.44	33.3	12.7
05/08/2010	23.51.32	35.1	-30.7
07/08/2010	18.18.16	-22.4	0.6
09/08/2010	12.44.58	-43.7	57.8
11/08/2010	7.11.33	10.0	31.3
13/08/2010	1.38.06	47.5	-24.6
14/08/2010	20.04.35	2.5	-18.6
16/08/2010	14.31.03	-47.1	39.4
18/08/2010	8.57.24	-15.3	48.3
20/08/2010	3.23.44	40.2	-11.3
21/08/2010	21.49.59	26.2	-32.7
23/08/2010	16.16.15	-31.9	18.4
25/08/2010	10.42.24	-37.6	58.0
27/08/2010	5.08.32	19.5	5.9
28/08/2010	23.34.37	43.8	-38.3
30/08/2010	18.00.42	-8.6	-2.3
01/09/2010	12.26.41	-49.0	52.2

Date	Time	h	h S
23/11/2010	15.12.50	24.4	4.6
25/11/2010	9.40.51	-33.6	24.7
27/11/2010	4.08.59	-41.0	-23.1
28/11/2010	22.37.09	16.2	-68.9
30/11/2010	17.05.29	41.7	-15.2
02/12/2010	11.33.48	-8.7	25.6

Date	Time	h	h S
04/12/2010	6.02.16	-51.7	-4.2
06/12/2010	0.30.44	-9.5	-63.2
07/12/2010	18.59.23	41.5	-36.2
09/12/2010	13.28.01	17.2	17.2
11/12/2010	7.56.47	-40.0	11.9
13/12/2010	2.25.32	-34.1	-44.7

Date	Time	h	h S
14/12/2010	20.54.28	23.8	-56.7
16/12/2010	15.23.24	38.2	2.3
18/12/2010	9.52.27	-16.2	22.3
20/12/2010	4.21.28	-50.1	-24.1
21/12/2010	22.50.41	-0.5	-71.0
23/12/2010	17.19.52	44.5	-17.0

Date	Time	h	h S
25/12/2010	11.49.10	10.4	24.1
27/12/2010	6.18.27	-44.7	-4.0
29/12/2010	0.47.55	-26.8	-62.9
30/12/2010	19.17.20	30.7	-37.7

# I Massima elongazione ovest - Maxima west elongation

Date	Time	h	h S
01/01/2010	2.28.56	-61.6	-45.7
02/01/2010	20.59.08	-16.3	-55.7
04/01/2010	15.29.19	32.0	3.2
06/01/2010	9.59.32	10.7	23.1
08/01/2010	4.29.48	-47.1	-23.5
09/01/2010	23.00.05	-41.9	-69.6
11/01/2010	17.30.22	15.8	-16.3
13/01/2010	12.00.41	30.2	25.9
15/01/2010	6.31.01	-21.3	-1.2
17/01/2010	1.01.24	-59.5	-60.2
18/01/2010	19.31.46	-8.6	-37.3
20/01/2010	14.02.09	35.2	17.9
22/01/2010	8.32.33	5.3	16.8
24/01/2010	3.03.01	-51.6	-38.7
25/01/2010	21.33.26	-34.6	-57.0
27/01/2010	16.03.53	22.2	2.2
29/01/2010	10.34.20	27.3	29.0
31/01/2010	5.04.50	-27.3	-15.4
01/02/2010	23.35.18	-55.4	-64.8
03/02/2010	18.05.48	-0.3	-18.3
05/02/2010	12.36.17	37.2	29.9
07/02/2010	7.06.50	0.1	7.5
09/02/2010	1.37.20	-54.7	-50.8
10/02/2010	20.07.52	-27.0	-39.1
12/02/2010	14.38.23	28.2	19.1
14/02/2010	9.08.57	23.7	26.6
16/02/2010	3.39.28	-33.0	-28.0
17/02/2010	22.10.01	-50.0	-55.5
19/02/2010	16.40.33	6.7	1.2
21/02/2010	11.11.08	37.9	37.4
23/02/2010	5.41.39	-6.3	-3.3
25/02/2010	0.12.12	-56.2	-55.6
26/02/2010	18.42.44	-19.3	-20.2
28/02/2010	13.13.19	33.6	34.3
02/03/2010	7.43.49	19.3	19.8
04/03/2010	2.14.22	-38.3	-38.3
05/03/2010	20.44.52	-43.7	-39.6
07/03/2010	15.15.27	14.0	19.4
09/03/2010	9.45.56	37.3	38.6
11/03/2010	4.16.28	-12.1	-14.7
12/03/2010	22.46.57	-55.7	-50.3
14/03/2010	17.17.29	-11.6	-0.3
16/03/2010	11.47.57	38.1	45.9
18/03/2010	6.18.27	14.4	10.2
20/03/2010	0.48.53	-43.0	-43.7
21/03/2010	19.19.23	-36.7	-21.6
23/03/2010	13.49.48	21.2	36.9
25/03/2010	8.20.16	35.4	33.5
27/03/2010	2.50.38	-18.0	-24.5
28/03/2010	21.21.05	-53.2	-37.7
30/03/2010	15.51.27	-3.3	18.4
01/04/2010	10.21.51	41.5	50.7

Date	Time	h	h S
03/04/2010	4.52.09	8.9	-0.2
04/04/2010	23.22.33	-46.8	-42.0
06/04/2010	17.52.50	-29.4	-2.0
08/04/2010	12.23.10	28.0	52.1
10/04/2010	6.53.24	32.2	23.8
12/04/2010	1.23.42	-23.9	-31.3
13/04/2010	19.53.55	-49.2	-21.6
15/04/2010	14.24.09	4.5	37.2
17/04/2010	8.54.18	43.5	46.5
19/04/2010	3.24.31	3.1	-11.5
20/04/2010	21.54.37	-49.4	-33.5
22/04/2010	16.24.46	-21.7	16.7
24/04/2010	10.54.48	34.4	60.7
26/04/2010	5.24.55	27.8	11.8
27/04/2010	23.54.55	-29.7	-33.0
29/04/2010	18.24.57	-43.8	-3.4
01/05/2010	12.54.52	12.3	54.8
03/05/2010	7.24.51	43.7	35.5
05/05/2010	1.54.44	-3.2	-20.4
06/05/2010	20.24.38	-50.5	-20.2
08/05/2010	14.54.25	-13.7	36.2
10/05/2010	9.24.17	40.0	57.1
12/05/2010	3.54.01	22.4	-0.3
13/05/2010	22.23.47	-35.2	-28.6
15/05/2010	16.53.25	-37.4	15.3
17/05/2010	11.23.07	20.1	67.2
19/05/2010	5.52.42	42.0	21.2
21/05/2010	0.22.18	-10.3	-25.6
22/05/2010	18.51.46	-49.8	-3.7
24/05/2010	13.21.18	-5.4	55.1
26/05/2010	7.50.43	44.4	43.7
28/05/2010	2.20.09	16.1	-12.8
29/05/2010	20.49.26	-40.3	-18.6
31/05/2010	15.18.47	-30.3	34.8
02/06/2010	9.48.01	27.7	63.8
04/06/2010	4.17.16	38.4	5.8
05/06/2010	22.46.21	-17.4	-25.2
07/06/2010	17.15.30	-47.2	14.3
09/06/2010	11.44.31	3.3	69.7
11/06/2010	6.13.34	47.0	26.4
13/06/2010	0.42.26	8.9	-21.6
14/06/2010	19.11.23	-44.4	-4.1
16/06/2010	13.40.10	-22.4	54.2
18/06/2010	8.08.59	34.9	47.7
20/06/2010	2.37.38	32.9	-9.4
21/06/2010	21.06.20	-24.6	-18.3
23/06/2010	15.34.54	-42.7	33.6
25/06/2010	10.03.28	11.8	66.2
27/06/2010	4.31.53	47.2	8.0
28/06/2010	23.00.20	1.2	-24.7
30/06/2010	17.28.38	-47.2	13.0
02/07/2010	11.56.58	-13.9	69.2

Date	Time	h	h S
04/07/2010	6.25.07	41.3	27.6
06/07/2010	0.53.19	25.9	-21.6
07/07/2010	19.21.21	-31.9	-5.7
09/07/2010	13.49.25	-36.6	52.7
11/07/2010	8.17.17	20.5	47.6
13/07/2010	2.45.13	44.6	-10.3
14/07/2010	21.12.59	-8.0	-20.2
16/07/2010	15.40.46	-47.9	31.9
18/07/2010	10.08.21	-4.8	64.4
20/07/2010	4.36.00	45.9	6.4
21/07/2010	23.03.29	17.6	-27.6
23/07/2010	17.30.59	-38.8	11.1
25/07/2010	11.58.18	-29.2	66.1
27/07/2010	6.25.40	28.9	25.0
29/07/2010	0.52.52	39.2	-25.4
30/07/2010	19.20.05	-17.1	-8.5
01/08/2010	13.47.08	-46.0	50.3
03/08/2010	8.14.12	4.7	43.9
05/08/2010	2.41.08	47.9	-14.7
06/08/2010	21.08.05	8.1	-24.3
08/08/2010	15.34.51	-44.7	29.7
10/08/2010	10.01.40	-20.6	58.9
12/08/2010	4.28.20	36.5	1.6
13/08/2010	22.55.01	31.5	-33.3
15/08/2010	17.21.32	-26.6	8.4
17/08/2010	11.48.06	-41.4	60.5
19/08/2010	6.14.31	14.1	19.4
21/08/2010	0.40.59	46.3	-32.4
22/08/2010	19.07.16	-1.6	-12.1
24/08/2010	13.33.37	-48.4	46.6
26/08/2010	7.59.50	-11.2	37.2
28/08/2010	2.26.06	42.5	-22.0
29/08/2010	20.52.13	22.0	-29.6
31/08/2010	15.18.22	-35.7	26.8
02/09/2010	9.44.26	-34.5	50.8
04/09/2010	4.10.33	23.3	-6.3
05/09/2010	22.36.30	41.2	-40.8
07/09/2010	17.02.33	-13.2	5.5
09/09/2010	11.28.29	-48.8	53.0
11/09/2010	5.54.30	-0.6	11.6
13/09/2010	0.20.23	45.6	-41.3
14/09/2010	18.46.21	11.6	-15.9
16/09/2010	13.12.14	-43.7	41.6
18/09/2010	7.38.12	-26.1	28.6
20/09/2010	2.04.04	31.6	-31.0
21/09/2010	20.30.02	33.6	-35.0
23/09/2010	14.55.56	-23.8	23.2
25/09/2010	9.21.56	-45.7	41.4
27/09/2010	3.47.50	8.6	-15.0
28/09/2010	22.13.51	45.3	-48.8
30/09/2010	16.39.49	1.1	2.4
02/10/2010	11.05.54	-49.3	44.4

Date	Time	h	h S
04/10/2010	5.31.55	-16.8	3.1
05/10/2010	23.58.02	38.2	-50.8
07/10/2010	18.24.08	24.5	-19.4
09/10/2010	12.50.22	-33.7	35.4
11/10/2010	7.16.33	-39.6	19.6
13/10/2010	1.42.51	17.8	-40.1
14/10/2010	20.09.08	41.6	-39.9
16/10/2010	14.35.34	-10.0	18.8
18/10/2010	9.01.58	-51.4	32.0
20/10/2010	3.28.29	-7.3	-23.3
21/10/2010	21.55.01	42.5	-56.1
23/10/2010	16.21.42	14.9	-0.7
25/10/2010	10.48.20	-42.0	35.9
27/10/2010	5.15.07	-31.9	-5.0
28/10/2010	23.41.55	26.1	-59.7
30/10/2010	18.08.52	35.8	-22.8
01/11/2010	12.35.48	-19.9	29.0
03/11/2010	7.02.52	-49.6	11.9
05/11/2010	1.29.58	2.3	-47.7
06/11/2010	19.57.13	44.1	-44.0
08/11/2010	14.24.27	5.7	14.2
10/11/2010	8.51.49	-48.1	24.3
12/11/2010	3.19.14	-23.4	-29.6
13/11/2010	21.46.48	33.2	-61.9
15/11/2010	16.14.21	39.0	-4.8
17/11/2010	10.42.02	-28.6	28.9
19/11/2010	5.09.45	-44.9	-10.7
20/11/2010	23.37.37	10.9	-66.3
22/11/2010	18.05.29	43.3	-25.7
24/11/2010	12.33.29	-2.8	23.7
26/11/2010	7.01.31	-51.2	6.7
28/11/2010	1.29.42	-14.9	-52.4
29/11/2010	19.57.52	38.8	-46.8
01/12/2010	14.26.10	21.8	10.6
03/12/2010	8.54.29	-36.0	19.5
05/12/2010	3.22.58	-38.6	-32.9
06/12/2010	21.51.26	19.0	-65.5
08/12/2010	16.20.01	40.7	-7.4
10/12/2010	10.48.38	-11.4	25.0
12/12/2010	5.17.23	-51.3	-13.2
13/12/2010	23.46.08	-6.4	-69.5
15/12/2010	18.15.00	42.9	-27.6
17/12/2010	12.43.52	14.8	21.0
19/12/2010	7.12.53	-41.8	5.0
21/12/2010	1.41.54	-31.5	-53.5
22/12/2010	20.11.00	26.5	-48.5
24/12/2010	14.40.07	36.8	8.9
26/12/2010	9.09.22	-18.6	18.8
28/12/2010	3.38.37	-48.9	-32.6
29/12/2010	22.07.56	2.1	-66.7
31/12/2010	16.37.17	45.3	-8.7

# II Congiunzione superiore - Superior conjunction

Date	Time	h	h S
30/09/2010	23.51.52	41.3	-49.5
04/10/2010	13.00.14	-35.4	36.2
08/10/2010	2.08.00	17.4	-34.9
11/10/2010	15.16.58	-6.2	13.6
15/10/2010	4.25.27	-13.7	-11.7
18/10/2010	17.35.16	23.9	-13.6
22/10/2010	6.44.42	-42.1	11.8

Date	Time	h	h S
25/10/2010	19.55.30	43.4	-40.9
29/10/2010	9.05.59	-50.5	29.1
01/11/2010	22.17.56	35.6	-61.4
05/11/2010	11.29.38	-28.7	31.8
09/11/2010	0.42.49	7.8	-56.0
12/11/2010	13.55.44	3.4	17.3
16/11/2010	3.10.12	-24.7	-32.0

Date	Time	h	h S
19/11/2010	16.24.24	32.7	-7.2
23/11/2010	5.40.11	-49.5	-6.1
26/11/2010	18.55.39	43.8	-35.3
30/11/2010	8.12.39	-43.6	15.5
03/12/2010	21.29.21	24.5	-62.3
07/12/2010	10.47.34	-13.7	25.3
11/12/2010	0.05.30	-8.1	-67.2

Date	Time	h	h S
14/12/2010	13.24.49	19.9	17.4
18/12/2010	2.43.50	-39.5	-41.9
21/12/2010	16.04.11	43.4	-4.0
25/12/2010	5.24.15	-49.9	-13.3
28/12/2010	18.45.33	36.0	-32.1

## II Congiunzione inferiore - Inferior conjunction

Date	Time	h	h S
02/01/2010	0.46.33	-54.8	-63.2
05/01/2010	14.10.56	34.7	14.1
09/01/2010	3.36.02	-54.3	-33.5
12/01/2010	17.00.55	19.7	-10.9
16/01/2010	6.26.34	-21.5	-1.9
19/01/2010	19.51.53	-12.8	-40.8
23/01/2010	9.17.57	13.4	22.1
26/01/2010	22.43.35	-46.8	-65.0
30/01/2010	12.10.01	35.7	29.5
03/02/2010	1.35.58	-57.0	-52.3
06/02/2010	15.02.41	27.0	14.0
10/02/2010	4.28.49	-27.8	-20.2
13/02/2010	17.55.46	-3.8	-14.3
17/02/2010	7.22.03	8.4	12.4
20/02/2010	20.49.11	-39.0	-43.7
24/02/2010	10.15.31	35.5	36.2
27/02/2010	23.42.43	-56.7	-55.9
03/03/2010	13.09.03	33.3	35.7
07/03/2010	2.36.16	-32.8	-33.7
10/03/2010	16.02.35	4.5	12.0
14/03/2010	5.29.43	3.5	0.3
17/03/2010	18.55.54	-31.0	-18.4
21/03/2010	8.22.53	34.0	32.5
24/03/2010	21.48.55	-54.2	-41.9
28/03/2010	11.15.41	38.8	51.1
01/04/2010	0.41.26	-37.6	-39.7

Date	Time	h	h S
04/04/2010	14.07.56	12.7	37.3
08/04/2010	3.33.22	-1.8	-13.4
11/04/2010	16.59.33	-22.4	8.3
15/04/2010	6.24.36	30.8	20.0
18/04/2010	19.50.19	-49.8	-19.8
22/04/2010	9.14.56	43.3	51.0
25/04/2010	22.40.09	-42.3	-34.2
29/04/2010	12.04.18	22.0	60.1
03/05/2010	1.28.56	-9.7	-24.0
06/05/2010	14.52.30	-12.3	36.2
10/05/2010	4.16.29	24.9	2.7
13/05/2010	17.39.27	-42.9	6.8
17/05/2010	7.02.44	45.5	33.9
20/05/2010	20.24.58	-46.7	-17.4
24/05/2010	9.47.28	32.1	62.7
27/05/2010	23.08.56	-19.2	-26.6
31/05/2010	12.30.36	0.4	63.8
04/06/2010	1.51.16	15.4	-15.7
07/06/2010	15.11.59	-32.7	36.8
11/06/2010	4.31.45	42.9	8.4
14/06/2010	17.51.29	-48.7	8.6
18/06/2010	7.10.19	42.2	36.9
21/06/2010	20.28.59	-30.8	-14.3
25/06/2010	9.46.47	14.8	63.9
28/06/2010	23.04.21	1.9	-24.7
02/07/2010	12.21.06	-18.2	66.7

Date	Time	h	h S
06/07/2010	1.37.33	33.0	-17.6
09/07/2010	14.53.08	-44.1	41.2
13/07/2010	4.08.22	48.0	2.7
16/07/2010	17.22.47	-42.9	13.3
20/07/2010	6.36.49	31.5	28.0
23/07/2010	19.50.05	-16.7	-11.6
27/07/2010	9.02.51	1.2	53.4
30/07/2010	22.14.56	15.2	-27.9
03/08/2010	11.26.31	-29.9	65.4
07/08/2010	0.37.28	41.6	-28.7
10/08/2010	13.47.52	-48.0	48.3
14/08/2010	2.57.41	45.3	-14.2
17/08/2010	16.07.00	-36.9	21.7
21/08/2010	5.15.50	22.9	8.3
24/08/2010	18.24.14	-8.9	-5.3
28/08/2010	7.32.11	-7.8	32.0
31/08/2010	20.39.46	21.3	-28.7
04/09/2010	9.47.01	-36.3	50.5
07/09/2010	22.54.01	43.6	-42.1
11/09/2010	12.00.48	-49.5	50.7
15/09/2010	1.07.23	41.6	-37.3
18/09/2010	14.13.56	-34.3	31.9
22/09/2010	3.20.24	17.6	-18.9
25/09/2010	16.26.58	-5.7	6.3
29/09/2010	5.33.34	-12.9	4.4
02/10/2010	18.40.22	23.7	-20.8

Date	Time	h	h S
06/10/2010	7.47.21	-40.6	25.7
09/10/2010	20.54.39	43.5	-45.0
13/10/2010	10.02.17	-50.6	38.6
16/10/2010	23.10.18	37.8	-57.0
20/10/2010	12.18.44	-31.4	34.3
24/10/2010	1.27.40	11.9	-45.3
27/10/2010	14.37.06	-0.5	15.3
31/10/2010	3.47.05	-19.5	-22.1
03/11/2010	16.57.36	28.3	-10.5
07/11/2010	6.08.44	-46.1	2.4
10/11/2010	19.20.27	44.0	-38.1
14/11/2010	8.32.50	-48.4	21.3
17/11/2010	21.45.48	31.1	-62.6
21/11/2010	10.59.23	-22.8	28.1
25/11/2010	0.13.36	1.7	-63.5
28/11/2010	13.28.26	9.8	18.0
02/12/2010	2.43.54	-30.7	-39.7
05/12/2010	15.59.55	37.5	-3.8
09/12/2010	5.16.35	-51.2	-12.9
12/12/2010	18.33.46	42.2	-31.3
16/12/2010	7.51.35	-38.0	10.6
19/12/2010	21.09.54	18.4	-59.0
23/12/2010	10.28.45	-6.0	23.9
26/12/2010	23.48.05	-15.0	-69.9
30/12/2010	13.07.57	27.0	19.8

## II Massima elongazione est - Maxima est elongation

Date	Time	h	h S
01/01/2010	3.36.48	-57.6	-33.2
04/01/2010	17.00.19	22.8	-12.1
08/01/2010	6.24.01	-27.0	-3.1
11/01/2010	19.48.01	-8.0	-41.6
15/01/2010	9.12.08	8.0	20.2
18/01/2010	22.36.29	-42.2	-66.3
22/01/2010	12.00.58	33.2	27.8
26/01/2010	1.25.38	-59.5	-55.4
29/01/2010	14.50.27	30.6	13.8
02/02/2010	4.15.23	-35.0	-24.2
05/02/2010	17.40.26	2.9	-13.2
09/02/2010	7.05.35	1.0	7.7
12/02/2010	20.30.51	-32.1	-42.7
16/02/2010	9.56.13	30.6	31.9
19/02/2010	23.21.37	-56.9	-59.0
23/02/2010	12.47.04	36.6	35.0
27/02/2010	2.12.36	-41.4	-40.2
02/03/2010	15.38.07	12.4	14.3
06/03/2010	5.03.46	-6.5	-7.5
09/03/2010	18.29.16	-22.3	-15.3
13/03/2010	7.54.56	26.8	25.3
16/03/2010	21.20.23	-51.5	-41.4
20/03/2010	10.46.04	40.8	47.2
24/03/2010	0.11.25	-46.2	-45.1
27/03/2010	13.37.00	21.5	39.8
31/03/2010	3.02.12	-13.4	-21.3

Date	Time	h	h S
03/04/2010	16.27.40	-12.5	12.6
07/04/2010	5.52.42	21.6	11.8
10/04/2010	19.17.59	-44.3	-16.7
14/04/2010	8.42.43	42.9	43.8
17/04/2010	22.07.47	-49.3	-35.3
21/04/2010	11.32.11	30.4	59.6
25/04/2010	0.56.59	-20.6	-29.7
28/04/2010	14.20.58	-1.3	40.4
02/05/2010	3.45.23	14.9	-4.5
05/05/2010	17.08.55	-35.5	10.9
09/05/2010	6.32.56	42.0	27.1
12/05/2010	19.55.58	-50.4	-15.2
16/05/2010	9.19.26	38.8	57.5
19/05/2010	22.41.52	-28.8	-27.8
23/05/2010	12.04.45	9.5	65.6
27/05/2010	1.26.32	5.8	-19.3
30/05/2010	14.48.46	-24.7	40.3
03/06/2010	4.09.47	36.9	4.5
06/06/2010	17.31.16	-48.0	11.4
10/06/2010	6.51.28	45.7	33.4
13/06/2010	20.12.09	-37.7	-12.7
17/06/2010	9.31.27	22.4	61.9
20/06/2010	22.51.12	-6.5	-24.4
24/06/2010	12.09.32	-11.0	68.2
28/06/2010	1.28.18	26.7	-17.9
01/07/2010	14.45.38	-40.2	42.8

Date	Time	h	h S
05/07/2010	4.03.19	47.4	2.8
08/07/2010	17.19.33	-45.9	14.4
12/07/2010	6.36.06	36.1	28.8
15/07/2010	19.51.13	-22.0	-10.7
19/07/2010	9.06.36	6.1	55.2
22/07/2010	22.20.30	10.5	-26.5
26/07/2010	11.34.42	-25.9	67.1
30/07/2010	0.47.26	39.0	-26.1
02/08/2010	14.00.27	-47.0	47.9
06/08/2010	3.12.01	46.7	-10.4
09/08/2010	16.23.50	-38.9	20.4
13/08/2010	5.34.16	25.7	13.0
16/08/2010	18.45.00	-11.1	-6.7
20/08/2010	7.54.27	-5.2	37.5
23/08/2010	21.04.09	19.8	-28.9
27/08/2010	10.12.41	-34.7	55.4
30/08/2010	23.21.33	43.3	-39.2
03/09/2010	12.29.23	-49.2	51.4
07/09/2010	1.37.36	42.5	-31.3
10/09/2010	14.44.53	-34.6	29.5
14/09/2010	3.52.39	18.4	-11.5
17/09/2010	16.59.39	-5.9	2.9
21/09/2010	6.07.16	-12.3	12.0
24/09/2010	19.14.16	23.8	-24.1
28/09/2010	8.21.55	-40.2	32.9
01/10/2010	21.29.08	43.8	-46.2

Date	Time	h	h S
05/10/2010	10.37.07	-50.2	42.9
08/10/2010	23.44.50	38.1	-52.8
12/10/2010	12.53.21	-31.2	34.0
16/10/2010	2.01.47	12.1	-37.8
19/10/2010	15.11.04	-0.4	12.1
23/10/2010	4.20.25	-19.3	-14.3
26/10/2010	17.30.39	28.4	-14.8
30/10/2010	6.41.00	-45.9	9.4
02/11/2010	19.52.17	44.1	-42.3
06/11/2010	9.03.46	-48.4	26.6
09/11/2010	22.16.13	31.4	-63.6
13/11/2010	11.28.55	-23.2	29.6
17/11/2010	0.42.31	2.1	-57.8
20/11/2010	13.56.27	9.2	15.8
24/11/2010	3.11.12	-30.2	-33.3
27/11/2010	16.26.23	36.9	-8.2
01/12/2010	5.42.17	-51.2	-7.2
04/12/2010	18.58.36	42.3	-36.0
08/12/2010	8.15.36	-39.0	14.6
11/12/2010	21.33.04	19.1	-63.0
15/12/2010	10.51.08	-7.4	24.7
19/12/2010	0.09.36	-14.0	-67.5
22/12/2010	13.28.38	25.5	17.3
26/12/2010	2.48.03	-43.5	-11.9
29/12/2010	16.07.59	45.1	-3.8

Date	Time	h	h S
22/06/2010	17.35.00	-48.2	11.8
26/06/2010	6.51.59	41.4	33.1
29/06/2010	20.08.28	-29.3	-11.9
03/07/2010	9.24.26	13.7	59.9
06/07/2010	22.39.55	2.9	-24.9
10/07/2010	11.54.51	-18.8	68.7
14/07/2010	1.09.14	33.3	-21.3
17/07/2010	14.23.03	-44.0	46.2
21/07/2010	3.36.20	48.1	-3.5
24/07/2010	16.49.04	-43.2	18.5
28/07/2010	6.01.15	32.1	20.4
31/07/2010	19.12.51	-17.7	-7.5
04/08/2010	8.23.57	2.2	45.5
07/08/2010	21.34.28	13.7	-27.1

Date	Time	h	h S
11/08/2010	10.44.32	-28.6	62.3
14/08/2010	23.54.01	40.2	-33.2
18/08/2010	13.03.05	-47.8	52.9
22/08/2010	2.11.40	45.9	-22.6
25/08/2010	15.19.53	-38.9	28.2
29/08/2010	4.27.43	25.0	-1.3
01/09/2010	17.35.12	-11.8	1.5
05/09/2010	6.42.24	-5.1	21.5
08/09/2010	19.49.22	18.4	-24.3
12/09/2010	8.56.12	-34.3	42.1
15/09/2010	22.02.54	41.8	-42.9
19/09/2010	11.09.33	-50.0	49.4
23/09/2010	0.16.12	42.7	-45.0
26/09/2010	13.22.58	-37.0	36.4

Date	Time	h	h S
30/09/2010	2.29.52	19.9	-29.3
03/10/2010	15.36.58	-8.8	12.7
07/10/2010	4.44.17	-10.6	-6.6
10/10/2010	17.52.00	21.2	-14.4
14/10/2010	7.00.02	-39.2	16.2
17/10/2010	20.08.37	42.4	-40.8
21/10/2010	9.17.30	-51.2	32.6
24/10/2010	22.27.05	38.5	-59.3
28/10/2010	11.37.02	-32.9	34.0
01/11/2010	0.47.48	12.9	-53.3
04/11/2010	13.58.56	-1.5	18.8
08/11/2010	3.10.55	-19.0	-30.4
11/11/2010	16.23.18	27.9	-5.8
15/11/2010	5.36.38	-46.2	-5.1

Date	Time	h	h S
18/11/2010	18.50.21	44.1	-33.6
22/11/2010	8.05.01	-48.0	16.2
25/11/2010	21.20.00	30.4	-60.3
29/11/2010	10.36.01	-21.4	26.3
02/12/2010	23.52.17	0.3	-67.4
06/12/2010	13.09.38	12.0	19.2
10/12/2010	2.27.07	-32.7	-44.0
13/12/2010	15.45.43	39.3	-0.9
17/12/2010	5.04.22	-51.2	-16.1
20/12/2010	18.24.11	41.0	-29.0
24/12/2010	7.43.57	-34.5	9.0
27/12/2010	21.04.51	14.6	-57.5
31/12/2010	10.25.37	-0.4	24.0

### III Congiunzione superiore - Superior conjunction

Date	Time	h	h S
06/01/2010	15.20.19	32.3	4.8
13/01/2010	19.46.59	-8.8	-41.0
21/01/2010	0.15.20	-56.7	-65.4
28/01/2010	4.45.45	-32.6	-19.3
04/02/2010	9.16.41	19.7	24.6
11/02/2010	13.48.49	33.7	25.2
18/02/2010	18.20.36	-11.2	-17.8
25/02/2010	22.52.28	-55.8	-56.1
05/03/2010	3.24.27	-25.4	-26.0
12/03/2010	7.56.21	26.5	25.2
19/03/2010	12.28.40	33.8	44.8
26/03/2010	16.59.43	-14.3	5.1
02/04/2010	21.30.10	-53.7	-37.1

Date	Time	h	h S
10/04/2010	1.58.45	-18.8	-27.5
17/04/2010	6.25.50	31.9	20.8
24/04/2010	10.51.34	34.8	60.6
01/05/2010	15.15.32	-13.8	31.1
08/05/2010	19.38.16	-50.8	-13.6
15/05/2010	23.58.02	-18.0	-27.9
23/05/2010	4.15.23	32.1	4.4
30/05/2010	8.29.09	40.0	50.9
06/06/2010	12.39.43	-5.4	63.2
13/06/2010	16.47.13	-46.4	19.8
20/06/2010	20.51.02	-27.8	-16.8
28/06/2010	0.51.41	20.5	-21.0
05/07/2010	4.47.27	47.8	10.0

Date	Time	h	h S
12/07/2010	8.38.55	16.0	51.3
19/07/2010	12.25.06	-29.7	64.6
26/07/2010	16.06.31	-46.1	26.0
02/08/2010	19.43.35	-10.7	-12.6
09/08/2010	23.16.00	32.2	-32.4
17/08/2010	2.44.49	45.3	-16.8
24/08/2010	6.08.59	11.1	17.6
31/08/2010	9.29.55	-30.8	49.7
07/09/2010	12.47.29	-48.5	48.0
14/09/2010	16.03.08	-18.6	14.2
21/09/2010	19.18.17	22.4	-23.8
28/09/2010	22.33.41	45.5	-49.8
06/10/2010	1.51.06	21.8	-37.1

Date	Time	h	h S
13/10/2010	5.10.07	-20.2	-2.5
20/10/2010	8.32.33	-50.9	28.1
27/10/2010	11.58.07	11.58.07	33.3
03/11/2010	15.27.59	13.4	5.5
10/11/2010	19.02.54	43.7	-34.9
17/11/2010	22.42.57	22.3	-66.9
25/11/2010	2.28.55	-23.5	-41.3
02/12/2010	6.19.18	-51.7	-0.5
09/12/2010	10.14.53	-18.3	24.2
16/12/2010	14.14.26	29.1	11.8
23/12/2010	18.18.15	40.7	-27.6
30/12/2010	22.26.23	-1.5	-68.6

### III Congiunzione inferiore - Inferior conjunction

Date	Time	h	h S
03/01/2010	1.15.44	-58.3	-58.6
10/01/2010	5.42.11	-33.4	-10.6
17/01/2010	10.10.45	18.4	25.2
24/01/2010	14.39.52	32.6	14.1
31/01/2010	19.09.49	-11.2	-30.7
07/02/2010	23.40.37	-56.9	-62.9
15/02/2010	4.12.14	-27.8	-22.2
22/02/2010	8.45.01	24.3	26.2
01/03/2010	13.17.15	33.0	34.2
08/03/2010	17.49.43	-14.5	-8.2
15/03/2010	22.21.03	-55.2	-47.7
23/03/2010	2.51.38	-20.3	-25.7
30/03/2010	7.21.33	30.6	25.4

Date	Time	h	h S
06/04/2010	11.50.41	33.1	53.6
13/04/2010	16.19.27	-16.1	16.0
20/04/2010	20.46.03	-52.2	-26.9
28/04/2010	1.11.10	-16.2	-27.4
05/05/2010	5.33.41	33.8	15.4
12/05/2010	9.53.54	35.9	61.4
19/05/2010	14.11.57	-12.0	45.6
26/05/2010	18.27.27	-49.3	1.0
02/06/2010	22.40.51	-20.3	-25.4
10/06/2010	2.50.14	29.1	-7.8
17/06/2010	6.56.13	43.9	34.3
24/06/2010	10.57.46	2.6	71.1
01/07/2010	14.55.10	-41.3	41.0

Date	Time	h	h S
08/07/2010	18.48.35	-36.2	-0.1
15/07/2010	22.37.34	8.7	-25.9
23/07/2010	2.22.43	45.9	-14.8
30/07/2010	6.02.22	30.7	20.3
06/08/2010	9.37.28	-13.3	56.8
13/08/2010	13.07.27	-46.9	53.7
20/08/2010	16.33.07	-31.1	16.1
27/08/2010	19.55.23	10.5	-21.2
03/09/2010	23.14.41	44.0	-40.7
11/09/2010	2.32.30	33.6	-24.4
18/09/2010	5.48.14	-6.2	9.1
25/09/2010	9.03.54	-43.7	39.3
02/10/2010	12.19.41	-42.3	41.0

Date	Time	h	h S
09/10/2010	15.37.06	-3.7	10.7
16/10/2010	18.57.29	34.8	-28.2
23/10/2010	22.21.35	39.5	-58.7
31/10/2010	1.50.40	2.4	-43.1
07/11/2010	5.23.42	-40.4	-5.8
14/11/2010	9.02.00	-45.3	24.3
21/11/2010	12.44.46	-3.0	23.3
28/11/2010	16.32.29	38.0	-9.3
05/12/2010	20.25.27	32.9	-51.9
13/12/2010	0.23.24	-12.7	-65.2
20/12/2010	4.26.45	-50.4	-23.1
27/12/2010	8.33.36	-24.3	15.1

### III Massima elongazione est - Maxima est elongation

Date	Time	h	h S
01/01/2010	6.00.07	-35.7	-7.5
08/01/2010	10.25.59	15.9	24.7
15/01/2010	14.54.26	32.9	10.1
22/01/2010	19.23.49	-9.2	-35.1
29/01/2010	23.54.45	-56.6	-64.9
06/02/2010	4.25.47	-30.8	-21.5
13/02/2010	8.57.19	21.5	25.0
20/02/2010	13.29.17	33.7	30.1
27/02/2010	18.01.31	-12.2	-12.4
06/03/2010	22.34.33	-55.5	-51.9
14/03/2010	3.06.40	-23.2	-26.3
21/03/2010	7.38.32	28.5	25.3
28/03/2010	12.08.53	33.6	49.4

Date	Time	h	h S
04/04/2010	16.38.09	-14.9	10.8
11/04/2010	21.06.25	-52.9	31.8
19/04/2010	1.33.22	-17.8	-27.7
26/04/2010	5.59.30	32.8	18.2
03/05/2010	10.23.02	35.4	61.9
10/05/2010	14.44.38	-13.0	38.3
17/05/2010	19.03.08	-50.0	-6.6
24/05/2010	23.18.53	-19.3	-27.1
01/06/2010	3.32.00	30.5	-1.2
08/06/2010	7.42.00	42.1	42.8
15/06/2010	11.49.21	-0.8	69.8
22/06/2010	15.52.10	-44.1	30.3
29/06/2010	19.51.06	-32.0	-9.6

Date	Time	h	h S
06/07/2010	23.45.09	14.7	-25.1
14/07/2010	3.34.39	47.7	-2.5
21/07/2010	7.19.50	23.8	35.9
28/07/2010	11.00.20	-21.4	66.6
04/08/2010	14.36.59	-48.1	41.1
11/08/2010	18.08.16	-21.3	1.3
18/08/2010	21.35.23	21.7	-30.5
26/08/2010	0.58.03	47.2	-32.3
02/09/2010	4.17.26	23.7	-4.5
09/09/2010	7.34.36	-18.1	30.0
16/09/2010	10.50.13	-48.9	50.4
23/09/2010	14.06.08	-32.2	31.3
30/09/2010	17.21.50	8.5	-5.7

Date	Time	h	h S
07/10/2010	20.39.14	41.9	-42.2
14/10/2010	23.58.30	32.9	-53.9
22/10/2010	3.21.05	-7.6	-25.0
29/10/2010	6.47.54	-46.2	10.7
05/11/2010	10.19.21	-39.9	31.7
12/11/2010	13.56.36	3.6	17.2
19/11/2010	17.38.17	40.8	-20.4
26/11/2010	21.25.22	29.1	-61.2
04/12/2010	1.16.48	-16.6	-55.6
11/12/2010	5.13.05	-51.2	-13.8
18/12/2010	9.14.13	-23.1	19.5
25/12/2010	13.19.47	25.9	18.3

### III Massima elongazione ovest - Maxima west elongation

Date	Time	h	h S
04/01/2010	20.23.19	-10.8	-49.1
12/01/2010	0.49.32	-57.9	-62.4
19/01/2010	5.17.07	-32.5	-14.5
26/01/2010	9.46.02	19.4	25.2
02/02/2010	14.16.11	32.9	19.4
09/02/2010	18.47.56	-11.7	-24.8
16/02/2010	23.19.43	-56.6	-60.1
24/02/2010	3.52.14	-25.9	-23.6
03/03/2010	8.23.58	25.9	26.3

Date	Time	h	h S
10/03/2010	12.55.20	33.1	39.

Date	Time	h	h S
20/09/2010	0.38.25	42.0	-42.0
27/09/2010	3.53.29	7.6	-14.0
04/10/2010	7.09.50	-33.7	20.2
11/10/2010	10.28.15	-49.6	40.5
18/10/2010	13.50.24	-16.8	24.9

Date	Time	h	h S
25/10/2010	17.15.34	25.4	-11.8
01/11/2010	20.45.18	43.5	-50.8
09/11/2010	0.19.02	12.0	-59.1
16/11/2010	3.57.37	-32.8	-23.2
23/11/2010	7.41.33	-49.6	12.9

Date	Time	h	h S
30/11/2010	11.30.40	-10.7	26.0
07/12/2010	15.25.32	34.2	1.9
14/12/2010	19.24.28	36.7	-40.6
21/12/2010	23.28.08	-8.2	-71.1
29/12/2010	3.35.10	-48.8	-33.3

#### IV Congiunzione superiore - Superior conjunction

Date	Time	h	h S
15/01/2010	0.48.10	-58.4	-62.3
31/01/2010	21.33.28	-37.4	-55.6
17/02/2010	18.29.44	-12.4	-19.7
06/03/2010	15.30.09	12.0	16.7
23/03/2010	12.27.22	32.8	46.3
09/04/2010	9.14.26	42.8	46.7

Date	Time	h	h S
26/04/2010	5.45.35	30.9	15.6
13/05/2010	1.52.42	1.6	-18.8
29/05/2010	21.28.43	-34.7	-22.2
15/06/2010	16.25.50	-45.2	23.8
02/07/2010	10.35.19	1.6	69.2
19/07/2010	3.49.50	48.0	-0.6

Date	Time	h	h S
04/08/2010	20.05.54	-5.1	-16.2
21/08/2010	11.24.31	-40.7	60.0
07/09/2010	1.57.27	40.5	-28.7
23/09/2010	16.07.09	-11.0	10.5
10/10/2010	6.21.22	-30.3	10.6
26/10/2010	21.08.34	43.7	-52.5

Date	Time	h	h S
12/11/2010	12.49.17	-9.2	24.8
29/11/2010	5.31.55	-50.4	-8.7
15/12/2010	23.16.15	-1.4	-71.2

#### IV Congiunzione inferiore - Inferior conjunction

Date	Time	h	h S
06/01/2010	13.31.14	34.2	18.6
23/01/2010	10.14.18	21.9	26.5
09/02/2010	7.13.24	2.2	9.0
26/02/2010	4.19.40	-19.6	-18.0
15/03/2010	1.26.36	-39.9	-41.3
31/03/2010	22.27.41	-53.0	-42.3

Date	Time	h	h S
17/04/2010	19.14.39	-46.1	-14.5
04/05/2010	15.41.14	-20.1	26.9
21/05/2010	11.40.14	15.0	67.2
07/06/2010	7.02.29	45.5	35.4
24/06/2010	1.40.17	26.2	-16.5
10/07/2010	19.25.32	-29.5	-6.5

Date	Time	h	h S
27/07/2010	12.11.02	-32.4	64.6
13/08/2010	3.56.12	40.1	-4.4
29/08/2010	18.47.09	-0.1	-10.8
15/09/2010	9.00.47	-37.0	41.8
01/10/2010	23.04.35	44.3	-51.4
18/10/2010	13.28.38	-20.7	27.8

Date	Time	h	h S
04/11/2010	4.37.57	-31.3	-13.5
20/11/2010	20.48.11	37.0	-54.8
07/12/2010	14.03.39	21.9	13.2
24/12/2010	8.19.27	-28.7	13.5

#### IV Massima elongazione est - Maxima est elongation

Date	Time	h	h S
02/01/2010	8.07.54	-11.5	12.0
19/01/2010	4.40.45	-38.9	-21.1
05/02/2010	1.31.04	-56.7	-52.7
21/02/2010	22.31.33	-53.5	-56.2
10/03/2010	19.33.43	-34.3	-26.7
27/03/2010	16.31.52	-9.7	10.4

Date	Time	h	h S
13/04/2010	13.18.55	16.9	47.0
30/04/2010	9.47.22	40.2	57.6
17/05/2010	5.50.25	41.1	20.5
03/06/2010	1.20.23	9.2	-19.1
19/06/2010	20.08.07	-35.1	-11.9
06/07/2010	14.06.00	-37.4	49.9

Date	Time	h	h S
23/07/2010	7.06.49	24.7	33.2
08/08/2010	23.07.27	30.3	-32.0
25/08/2010	14.11.54	-46.2	40.2
11/09/2010	4.34.58	13.4	-2.7
27/09/2010	18.40.38	20.2	-19.2
14/10/2010	8.58.39	-50.7	32.9

Date	Time	h	h S
30/10/2010	23.56.40	22.4	-59.1
16/11/2010	15.51.21	26.1	-0.4
03/12/2010	8.49.50	-36.7	19.1
20/12/2010	2.50.08	-41.3	-41.0

#### IV Massima elongazione ovest - Maxima west elongation

Date	Time	h	h S
10/01/2010	19.58.26	-9.4	-43.6
27/01/2010	16.45.27	16.1	-5.1
13/02/2010	13.44.55	33.6	26.2
02/03/2010	10.49.42	38.9	40.2
19/03/2010	7.53.46	29.6	27.2
05/04/2010	4.48.40	9.5	-0.2

Date	Time	h	h S
22/04/2010	1.28.20	-16.8	-27.4
08/05/2010	21.46.02	-43.1	-27.8
25/05/2010	17.33.34	-45.8	9.6
11/06/2010	12.43.10	-9.1	63.2
28/06/2010	7.07.02	38.7	35.8
15/07/2010	0.36.31	28.8	-23.9

Date	Time	h	h S
31/07/2010	17.06.54	-37.9	14.2
17/08/2010	8.38.29	-11.0	45.5
02/09/2010	23.19.26	44.1	-40.3
19/09/2010	13.29.55	-40.0	38.1
06/10/2010	3.38.17	2.9	-18.6
22/10/2010	18.13.04	32.2	-21.7

Date	Time	h	h S
08/11/2010	9.37.40	-43.9	28.7
25/11/2010	2.04.50	-19.2	-45.7
11/12/2010	19.35.08	36.7	-42.7
28/12/2010	14.03.39	34.1	13.9

I = Io

II = Europa

III = Ganimede

IV = Callisto

TEMPI IN T.U.

TIMES IN U.T.

H = altitudine di Giove sull'orizzonte

H S = altitudine del Sole sull'orizzonte

Date in the format dd/mm/yyyy

H = altitude of Jupiter on the horizon

H S = altitude of the Sun on the horizon

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# MERIDIANO CENTRALE DI GIOVE – TRANSITI

## CENTRAL MERIDIAN OF JUPITER – TRANSITS

Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian
01/01/2010	2.42.33	12.33.14	22.23.54	19/03/2010	5.28.24	15.19.02		04/06/2010	8.01.13	17.51.46		20/08/2010	0.19.56	10.10.21	20.00.46
02/01/2010	8.14.34	18.05.16		20/03/2010	1.09.41	11.00.20	20.50.59	05/06/2010	3.42.18	13.32.51	23.23.23	21/08/2010	5.51.11	15.41.35	
03/01/2010	3.55.56	13.46.36	23.37.16	21/03/2010	6.41.37	16.32.16		06/06/2010	9.13.56	19.04.28		22/08/2010	1.32.00	11.22.24	21.12.49
04/01/2010	9.27.57	19.18.38		22/03/2010	2.22.54	12.13.34	22.04.12	07/06/2010	4.55.01	14.45.33		23/08/2010	7.03.14	16.53.38	
05/01/2010	5.09.18	14.59.59		23/03/2010	7.54.51	17.45.29		08/06/2010	0.36.05	10.26.37	20.17.09	24/08/2010	2.44.03	12.34.27	22.24.52
06/01/2010	0.50.39	10.41.19	20.32.01	24/03/2010	3.36.08	13.26.47	23.17.25	09/06/2010	6.07.42	15.58.14		25/08/2010	8.15.16	18.05.40	
07/01/2010	6.22.41	16.13.22		25/03/2010	9.08.03	18.58.41		10/06/2010	1.48.46	11.39.18	21.29.49	26/08/2010	3.56.05	13.46.29	23.36.54
08/01/2010	2.04.02	11.54.42	21.45.24	26/03/2010	4.49.21	14.39.59		11/06/2010	7.20.22	17.10.53		27/08/2010	9.27.18	19.17.42	
09/01/2010	7.36.04	17.26.45		27/03/2010	0.30.37	10.21.15	20.11.53	12/06/2010	3.01.25	12.51.57	22.42.29	28/08/2010	5.08.07	14.58.31	
10/01/2010	3.17.25	13.08.05	22.58.47	28/03/2010	6.02.32	15.53.10		13/06/2010	8.33.00	18.23.32		29/08/2010	0.48.56	10.39.20	20.29.44
11/01/2010	8.49.27	18.40.08		29/03/2010	1.43.48	11.34.26	21.25.04	14/06/2010	4.14.04	14.04.35	23.55.07	30/08/2010	6.20.08	16.10.33	
12/01/2010	4.30.48	14.21.28		30/03/2010	7.15.43	17.06.21		15/06/2010	9.45.38	19.36.10		31/08/2010	2.00.57	11.51.22	21.41.45
13/01/2010	0.12.10	10.02.51	19.53.31	31/03/2010	2.56.59	12.47.37	22.38.15	16/06/2010	5.26.41	15.17.12		01/09/2010	7.32.10	17.22.34	
14/01/2010	5.44.11	15.34.52		01/04/2010	8.28.54	18.19.32		17/06/2010	1.07.43	10.58.15	20.48.46	02/09/2010	3.12.58	13.03.23	22.53.46
15/01/2010	1.25.33	11.16.14	21.06.54	02/04/2010	4.10.09	14.00.47	23.51.25	18/06/2010	6.39.17	16.29.48		03/09/2010	8.44.11	18.34.35	
16/01/2010	6.57.35	16.48.16		03/04/2010	9.42.03	19.32.41		19/06/2010	2.20.19	12.10.50	22.01.21	04/09/2010	4.24.59	14.15.24	
17/01/2010	2.38.57	12.29.37	22.20.18	04/04/2010	5.23.19	15.13.56		20/06/2010	7.51.52	17.42.23		05/09/2010	0.05.47	9.56.12	19.46.36
18/01/2010	8.10.58	18.01.40		05/04/2010	1.04.34	10.55.12	20.45.50	21/06/2010	3.32.54	13.23.25	23.13.55	06/09/2010	5.37.00	15.27.25	
19/01/2010	3.52.20	13.43.01	23.33.41	06/04/2010	6.36.28	16.27.05		22/06/2010	9.04.26	18.54.57		07/09/2010	1.17.48	11.08.12	20.58.37
20/01/2010	9.24.21	19.15.03		07/04/2010	2.17.42	12.08.21	21.58.58	23/06/2010	4.45.27	14.35.58		08/09/2010	6.49.01	16.39.25	
21/01/2010	5.05.44	14.56.24		08/04/2010	7.49.36	17.40.13		24/06/2010	0.26.29	10.16.59	20.07.29	09/09/2010	2.29.49	12.20.13	22.10.38
22/01/2010	0.47.04	10.37.45	20.28.27	09/04/2010	3.30.50	13.21.28	23.12.06	25/06/2010	5.58.00	15.48.30		10/09/2010	8.01.02	17.51.26	
23/01/2010	6.19.07	16.09.47		10/04/2010	9.02.43	18.53.20		26/06/2010	1.39.00	11.29.31	21.20.01	11/09/2010	3.41.50	13.32.14	23.22.39
24/01/2010	2.00.28	11.51.08	21.41.50	11/04/2010	4.43.57	14.34.35		27/06/2010	7.10.31	17.01.01		12/09/2010	9.13.03	19.03.28	
25/01/2010	7.32.30	17.23.11		12/04/2010	0.25.13	10.15.50	20.06.27	28/06/2010	2.51.31	12.42.01	22.32.31	13/09/2010	4.53.51	14.44.16	
26/01/2010	3.13.51	13.04.31	22.55.13	13/04/2010	5.57.04	15.47.42		29/06/2010	8.23.01	18.13.31		14/09/2010	0.34.40	10.25.05	20.15.29
27/01/2010	8.45.53	18.36.34		14/04/2010	1.38.19	11.28.56	21.19.32	30/06/2010	4.04.01	13.54.31	23.45.00	15/09/2010	6.05.53	15.56.17	
28/01/2010	4.27.14	14.17.55		15/04/2010	7.10.09	17.00.47		01/07/2010	9.35.30	19.26.00		16/09/2010	1.46.42	11.37.06	21.27.31
29/01/2010	0.08.36	9.59.17	19.49.57	16/04/2010	2.51.24	12.42.01	22.32.37	02/07/2010	5.16.29	15.06.59		17/09/2010	7.17.55	17.08.19	
30/01/2010	5.40.37	15.31.18		17/04/2010	8.23.14	18.13.52		03/07/2010	0.57.28	10.47.58	20.38.27	18/09/2010	2.58.44	12.49.08	22.39.33
31/01/2010	1.21.59	11.12.39	21.03.20	18/04/2010	4.04.28	13.55.05	23.45.42	04/07/2010	6.28.57	16.19.26		19/09/2010	8.29.57	18.20.22	
01/02/2010	6.54.00	16.44.40		19/04/2010	9.36.19	19.26.56		05/07/2010	2.09.55	12.00.24	21.50.54	20/09/2010	4.10.46	14.01.11	23.51.36
02/02/2010	2.35.22	12.26.02	22.16.43	20/04/2010	5.17.32	15.08.09		06/07/2010	7.41.23	17.31.52		21/09/2010	9.42.00	19.32.25	
03/02/2010	8.07.23	17.58.03		21/04/2010	0.58.45	10.49.22	20.39.59	07/07/2010	3.22.21	13.12.50	23.03.19	22/09/2010	5.22.49	15.13.14	
04/02/2010	3.48.45	13.39.25	23.30.05	22/04/2010	6.30.35	16.21.11		08/07/2010	8.53.48	18.44.17		23/09/2010	1.03.39	10.54.03	20.44.28
05/02/2010	9.20.45	19.11.26		23/04/2010	2.11.48	12.02.25	21.53.01	09/07/2010	4.34.45	14.25.14		24/09/2010	6.34.53	16.25.18	
06/02/2010	5.02.07	14.52.47		24/04/2010	7.43.37	17.34.13		10/07/2010	0.15.43	10.06.12	19.56.40	25/09/2010	2.15.43	12.06.08	21.56.33
07/02/2010	0.43.27	10.34.08	20.24.49	25/04/2010	3.24.49	13.15.26	23.06.02	11/07/2010	5.47.09	15.37.37		26/09/2010	7.46.58	17.37.23	
08/02/2010	6.15.29	16.06.09		26/04/2010	8.56.38	18.47.14		12/07/2010	1.28.06	11.18.34	21.09.03	27/09/2010	3.27.48	13.18.13	23.08.38
09/02/2010	1.56.50	11.47.30	21.38.11	27/04/2010	4.37.50	14.28.27		13/07/2010	6.59.31	16.49.59		28/09/2010	8.59.03	18.49.29	
10/02/2010	7.28.51	17.19.31		28/04/2010	0.19.03	10.09.39	20.00.15	14/07/2010	2.40.27	12.30.56	22.21.24	29/09/2010	4.39.54	14.30.19	
11/02/2010	3.10.12	13.00.52	22.51.33	29/04/2010	5.50.51	15.41.27		15/07/2010	8.11.52	18.02.20		30/09/2010	0.20.44	10.11.10	20.01.35
12/02/2010	8.42.13	18.32.53		30/04/2010	1.32.03	11.22.39	21.13.14	16/07/2010	3.52.48	13.43.16	23.33.44	01/10/2010	5.52.01	15.42.26	
13/02/2010	4.23.33	14.14.13		01/05/2010	7.03.50	16.54.26		17/07/2010	9.24.12	19.14.39		02/10/2010	1.32.51	11.23.17	21.13.43
14/02/2010	0.04.55	9.55.35	19.46.15	02/05/2010	2.45.02	12.35.37	22.26.13	18/07/2010	5.05.07	14.55.35		03/10/2010	7.04.08	16.54.34	
15/02/2010	5.36.55	15.27.35		03/05/2010	8.16.48	18.07.25		19/07/2010	0.46.03	10.36.31	20.26.58	04/10/2010	2.45.00	12.35.25	22.25.51
16/02/2010	1.18.16	11.08.56	20.59.36	04/05/2010	3.58.00	13.48.35	23.39.11	20/07/2010	6.17.26	16.07.53		05/10/2010	8.16.17	18.06.43	
17/02/2010	6.50.16	16.40.56		05/05/2010	9.29.46	19.20.22		21/07/2010	1.58.21	11.48.48	21.39.15	06/10/2010	3.57.09	13.47.35	23.38.01
18/02/2010	2.31.37	12.22.17	22.12.56	06/05/2010	5.10.57	15.01.33		22/07/2010	7.29.43	17.20.10		07/10/2010	9.28.27	19.18.53	
19/02/2010	8.03.36	17.54.16		07/05/2010	0.52.08	10.42.43	20.33.19	23/07/2010	3.10.37	13.01.05	22.51.32	08/10/2010	5.09.19	14.59.46	
20/02/2010	3.44.57	13.35.37	23.26.17	08/05/2010	6.23.54	16.14.29		24/07/2010	8.41.59	18.32.26		09/10/2010	0.50.12	10.40.39	20.31.05
21/02/2010	9.16.57	19.07.36		09/05/2010	2.05.04	11.55.39	21.46.14	25/07/2010	4.22.53	14.13.20		10/10/2010	6.21.31	16.11.58	
22/02/2010	4.58.17	14.48.57		10/05/2010	7.36.49	17.27.24		26/07/2010	0.03.47	9.54.14	19.44.41	11/10/2010	2.02.25	11.52.51	21.43.18
23/02/2010	0.39.37	10.30.17	20.20.56	11/05/2010	3.17.59	13.08.34	22.59.09	27/07/2010	5.35.07	15.25.34		12/10/2010	7.33.44	17.24.11	
24/02/2010	6.11.37	16.02.17		12/05/2010	8.49.44	18.40.18		28/07/2010	1.16.01	11.06.27	20.56.54	13/10/2010	3.14.38	13.05.05	22.55.32
25/02/2010	1.52.57	11.43.36	21.34.16	13/05/2010	4.30.53	14.21.28		29/07/2010	6.47.21	16.37.48		14/10/2010	8.45.59	18.36.26	
26/02/2010	7.24.57	17.15.36		14/05/2010	0.12.03	10.02.37	19.53.12	30/07/2010	2.28.14	12.18.40	22.09.07	15/10/2010	4.26.53	14.17.21	
27/02/2010	3.06.16	12.56.55	22.47.35	15/05/2010	5.43.46	15.34.21		31/07/2010	7.59.33	17.50.00		16/10/2010	0.07.48	9.58.15	19.48.43
28/02/2010	8.38.16	18.28.55		16/05/2010	1.24.56	11.15.30	21.06.04	01/08/2010	3.40.26	13.30.52	23.21.18	17/10/2010	5.39.10	15.29.38	
01/03/2010	4.19.35	14.10.14		17/05/2010	6.56.39	16.47.13		02/08/2010	9.11.45	19.02.11		18/10/2010	1.20.05	11.10.33	21.01.01
02/03/2010	0.00.55	9.51.34	19.42.14	18/05/2010	2.37.48	12.28.22	22.18.56	03/08/2010	4.52.37	14.43.03		19/10/2010	6.51.28	16.41.56	
03/03/2010	5.32.53	15.23.32		19/05/2010	8.09.30	18.00.05		04/08/2010	0.33.29	10.23.55	20.14.21	20/10/2010	2.32		



Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian
05/11/2010	2.21.24	12.11.55	22.02.25	20/11/2010	6.31.03	16.21.36		05/12/2010	0.51.38	10.42.13	20.32.50	20/12/2010	5.04.07	14.54.44	
06/11/2010	7.52.56	17.43.27		21/11/2010	2.12.09	12.02.43	21.53.16	06/12/2010	6.23.25	16.14.00		21/12/2010	0.45.21	10.35.59	20.26.37
07/11/2010	3.33.58	13.24.29	23.15.00	22/11/2010	7.43.50	17.34.23		07/12/2010	2.04.36	11.55.12	21.45.48	22/12/2010	6.17.14	16.07.52	
08/11/2010	9.05.31	18.56.02		23/11/2010	3.24.57	13.15.31	23.06.04	08/12/2010	7.36.24	17.26.59		23/12/2010	1.58.29	11.49.07	21.39.45
09/11/2010	4.46.33	14.37.05		24/11/2010	8.56.38	18.47.12		09/12/2010	3.17.35	13.08.11	22.58.48	24/12/2010	7.30.23	17.21.00	
10/11/2010	0.27.36	10.18.07	20.08.39	25/11/2010	4.37.46	14.28.20		10/12/2010	8.49.24	18.40.00		25/12/2010	3.11.38	13.02.16	22.52.55
11/11/2010	5.59.10	15.49.42		26/11/2010	0.18.54	10.09.28	20.00.02	11/12/2010	4.30.36	14.21.12		26/12/2010	8.43.32	18.34.10	
12/11/2010	1.40.14	11.30.46	21.21.17	27/11/2010	5.50.36	15.41.11		12/12/2010	0.11.49	10.02.25	19.53.02	27/12/2010	4.24.48	14.15.26	
13/11/2010	7.11.49	17.02.22		28/11/2010	1.31.45	11.22.19	21.12.54	13/12/2010	5.43.38	15.34.14		28/12/2010	0.06.05	9.56.43	19.47.21
14/11/2010	2.52.54	12.43.26	22.33.58	29/11/2010	7.03.28	16.54.03		14/12/2010	1.24.52	11.15.28	21.06.05	29/12/2010	5.37.59	15.28.37	
15/11/2010	8.24.30	18.15.03		30/11/2010	2.44.38	12.35.12	22.25.47	15/12/2010	6.56.41	16.47.18		30/12/2010	1.19.16	11.09.55	21.00.33
16/11/2010	4.05.35	13.56.08	23.46.40	01/12/2010	8.16.22	18.06.57		16/12/2010	2.37.55	12.28.32	22.19.09	31/12/2010	6.51.11	16.41.50	
17/11/2010	9.37.13	19.27.46		02/12/2010	3.57.32	13.48.07	23.38.42	17/12/2010	8.09.46	18.00.24					
18/11/2010	5.18.18	15.08.51		03/12/2010	9.29.17	19.19.53		18/12/2010	3.51.00	13.41.37	23.32.15				
19/11/2010	0.59.24	10.49.57	20.40.30	04/12/2010	5.10.28	15.01.03		19/12/2010	9.22.52	19.13.30					

Zero meridian = Ore dei passaggi

Orari in T.U. in cui transita il Meridiano Centrale

Date in the format dd/mm/yyyy

TIMES IN U.T.

# MERIDIANO CENTRALE DI GIOVE I

(Valido per le regioni equatoriali)

# CENTRAL MERIDIAN OF JUPITER I

(For equatorial zones)

Data	Gen	Feb	Mar	Apr	Mag	Giu	Lug	Ago	Set	Ott	Nov	Dic
Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	°	°	°	°	°	°	°	°	°	°	°	°
1	252.8	100.0	195.5	45.5	100.0	314.5	13.8	232.8	91.5	149.5	2.0	53.5
2	50.3	257.8	353.3	203.3	257.8	112.5	171.8	30.8	249.5	307.5	159.8	211.0
3	208.0	55.5	151.0	1.0	55.5	270.3	329.8	188.8	47.5	105.3	317.5	8.8
4	5.5	213.0	308.8	159.0	213.5	68.3	127.8	346.8	205.3	263.3	115.3	166.5
5	163.3	10.8	106.3	316.8	11.3	226.3	285.8	144.8	3.3	61.0	273.0	324.3
6	321.0	168.5	264.0	114.5	169.3	24.3	83.8	302.8	161.3	219.0	70.8	121.8
7	118.5	326.3	61.8	272.3	327.0	182.3	241.8	101.0	319.3	16.8	228.5	279.5
8	276.3	123.8	219.5	70.0	125.0	340.0	39.8	259.0	117.3	174.5	26.3	77.3
9	73.8	281.5	17.3	227.8	282.8	138.0	197.8	57.0	275.3	332.5	184.0	234.8
10	231.5	79.3	175.0	25.8	80.8	296.0	355.8	215.0	73.3	130.3	341.8	32.5
11	29.3	236.8	332.8	183.5	238.5	94.0	153.8	13.0	231.3	288.3	139.3	190.3
12	186.8	34.5	130.5	341.3	36.5	252.0	311.8	171.0	29.0	86.0	297.0	347.8
13	344.5	192.3	288.3	139.0	194.3	50.0	110.0	329.0	187.0	243.8	94.8	145.5
14	142.0	350.0	86.0	296.8	352.3	207.8	268.0	127.3	345.0	41.8	252.5	303.0
15	299.8	147.5	243.8	94.8	150.0	5.8	66.0	285.3	143.0	199.5	50.3	100.8
16	97.5	305.3	41.5	252.5	308.0	163.8	224.0	83.3	301.0	357.3	208.0	258.5
17	255.0	103.0	199.3	50.3	105.8	321.8	22.0	241.3	98.8	155.0	5.8	56.0
18	52.8	260.8	357.0	208.0	263.8	119.8	180.0	39.3	256.8	313.0	163.5	213.8
19	210.5	58.5	154.8	6.0	61.5	277.8	338.0	197.3	54.8	110.8	321.0	11.5
20	8.0	216.0	312.5	163.8	219.5	75.8	136.3	355.3	212.8	268.5	118.8	169.0
21	165.8	13.8	110.3	321.5	17.5	233.8	294.3	153.3	10.5	66.3	276.5	326.8
22	323.5	171.5	268.0	119.3	175.3	31.8	92.3	311.3	168.5	224.3	74.3	124.3
23	121.0	329.3	65.8	277.3	333.3	189.8	250.3	109.3	326.5	22.0	232.0	282.0
24	278.8	127.0	223.5	75.0	131.0	347.8	48.3	267.5	124.3	179.8	29.5	79.8
25	76.5	284.8	21.3	232.8	289.0	145.8	206.3	65.5	282.3	337.5	187.3	237.3
26	234.0	82.3	179.0	30.8	87.0	303.8	4.5	223.5	80.0	135.3	345.0	35.0
27	31.8	240.0	336.8	188.5	244.8	101.8	162.5	21.5	238.0	293.0	142.8	192.5
28	189.5	37.8	134.5	346.3	42.8	259.8	320.5	179.5	36.0	90.8	300.3	350.3
29	347.0		292.3	144.3	200.8	57.8	118.5	337.5	193.8	248.5	98.0	147.8
30	144.8		90.0	302.0	358.8	215.8	276.5	135.5	351.8	46.5	255.8	305.5
31	302.5		247.8		156.5		74.5	293.5		204.3		103.3

Moto del meridiano centrale - Motion of the central meridian

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
m	°	°	°	°	°	°	°	°	°	°	°	°
00	0.0	36.6	73.2	109.7	146.3	182.9	219.5	256.1	292.6	329.2	5.8	42.4
10	6.1	42.7	79.3	115.8	152.4	189.0	225.6	262.2	298.7	335.3	11.9	48.5
20	12.2	48.8	85.4	121.9	158.5	195.1	231.7	268.2	304.8	341.4	18.0	54.6
30	18.3	54.9	91.4	128.0	164.6	201.2	237.8	274.3	310.9	347.5	24.1	60.7
40	24.4	61.0	97.5	134.1	170.7	207.3	243.9	280.4	317.0	353.6	30.2	66.8
50	30.5	67.1	103.6	140.2	176.8	213.4	250.0	286.5	323.1	359.7	36.3	72.9
60	36.6	73.2	109.7	146.3	182.9	219.5	256.1	292.6	329.2	5.8	42.4	79.0

Longitudine del meridiano che transita alle ore 0 T.U. del giorno indicato e moto medio in gradi

Longitude of the meridian that transits at 0 U.T. and motion in °

# MERIDIANO CENTRALE DI GIOVE II

(Valido per le regioni a media latitudine)

# CENTRAL MERIDIAN OF JUPITER II

(For middle latitude zones)

Data	Gen	Feb	Mar	Apr	Mag	Giu	Lug	Ago	Set	Ott	Nov	Dic
Date	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
	°	°	°	°	°	°	°	°	°	°	°	°
1	88.0	58.3	298.7	270.2	93.2	68.1	255.2	235.1	217.2	49.4	29.7	216.1
2	238.0	208.3	88.8	60.3	243.3	218.3	45.5	25.4	7.7	199.8	180.0	6.2
3	28.1	358.3	238.8	210.4	33.4	8.5	195.7	175.8	158.1	350.2	330.3	156.4
4	178.1	148.3	28.8	0.5	183.5	158.7	346.0	326.2	308.5	140.5	120.5	306.5
5	328.1	298.3	178.9	150.5	333.7	308.9	136.3	116.6	98.9	290.9	270.8	96.6
6	118.1	88.3	328.9	300.6	123.8	99.1	286.6	266.9	249.3	81.3	61.1	246.8
7	268.1	238.3	118.9	90.7	273.9	249.3	76.9	57.3	39.7	231.7	211.3	36.9
8	58.1	28.3	269.0	240.8	64.1	39.5	227.2	207.7	190.1	22.0	1.5	187.0
9	208.1	178.3	59.0	30.9	214.2	189.8	17.5	358.1	340.5	172.4	151.8	337.2
10	358.1	328.4	209.0	180.9	4.4	340.0	167.8	148.4	131.0	322.8	302.0	127.3
11	148.1	118.4	359.1	331.0	154.5	130.2	318.1	298.8	281.4	113.1	92.3	277.4
12	298.1	268.4	149.1	121.1	304.7	280.4	108.4	89.2	71.8	263.5	242.5	67.5
13	88.1	58.4	299.2	271.2	94.8	70.6	258.7	239.6	222.2	53.8	32.7	217.6
14	238.1	208.4	89.2	61.3	245.0	220.9	49.0	30.0	12.6	204.2	182.9	7.7
15	28.1	358.4	239.3	211.4	35.1	11.1	199.3	180.4	163.0	354.5	333.1	157.8
16	178.2	148.4	29.3	1.5	185.3	161.3	349.6	330.8	313.4	144.8	123.4	307.9
17	328.2	298.5	179.4	151.6	335.4	311.6	140.0	121.2	103.8	295.2	273.6	98.0
18	118.2	88.5	329.4	301.7	125.6	101.8	290.3	271.6	254.3	85.5	63.8	248.1
19	268.2	238.5	119.5	91.8	275.8	252.1	80.6	61.9	44.7	235.8	214.0	38.2
20	58.2	28.5	269.5	241.9	65.9	42.3	230.9	212.3	195.1	26.2	4.2	188.3
21	208.2	178.5	59.6	32.0	216.1	192.6	21.3	2.7	345.5	176.5	154.4	338.4
22	358.2	328.6	209.6	182.1	6.3	342.8	171.6	153.2	135.9	326.8	304.5	128.5
23	148.2	118.6	359.7	332.2	156.4	133.1	321.9	303.6	286.3	117.1	94.7	278.6
24	298.2	268.6	149.7	122.3	306.6	283.3	112.3	94.0	76.7	267.4	244.9	68.6
25	88.2	58.6	299.8	272.4	96.8	73.6	262.6	244.4	227.1	57.7	35.1	218.7
26	238.2	208.7	89.8	62.5	247.0	223.8	53.0	34.8	17.5	208.0	185.3	8.8
27	28.2	358.7	239.9	212.7	37.2	14.1	203.3	185.2	167.9	358.3	335.4	158.9
28	178.2	148.7	30.0	2.8	187.3	164.4	353.7	335.6	318.2	148.6	125.6	308.9
29	328.2		180.0	152.9	337.5	314.6	144.0	126.0	108.6	298.9	275.8	99.0
30	118.2		330.1	303.0	127.7	104.9	294.4	276.4	259.0	89.2	65.9	249.1
31	268.3		120.2		277.9		84.7	66.8		239.5		39.1

## Moto del meridiano centrale - Motion of the central meridian

	0h	1h	2h	3h	4h	5h	6h	7h	8h	9h	10h	11h
m	°	°	°	°	°	°	°	°	°	°	°	°
0	0.0	36.3	72.5	108.8	145.0	181.3	217.6	253.8	290.1	326.4	2.6	38.9
10	6.0	42.3	78.6	114.8	151.1	187.3	223.6	259.9	296.1	332.4	8.7	44.9
20	12.1	48.3	84.6	120.9	157.1	193.4	229.7	265.9	302.2	338.4	14.7	51.0
30	18.1	54.4	90.7	126.9	163.2	199.4	235.7	272.0	308.2	344.5	20.7	57.0
40	24.2	60.4	96.7	133.0	169.2	205.5	241.7	278.0	314.3	350.5	26.8	63.0
50	30.2	66.5	102.7	139.0	175.3	211.5	247.8	284.0	320.3	356.6	32.8	69.1
60	36.3	72.5	108.8	145.0	181.3	217.6	253.8	290.1	326.4	2.6	38.9	75.1

Longitude del meridiano che transita alle ore 0 T.U. del giorno indicato e moto medio in gradi

Longitude of the meridian that transits at 0 U.T. and motion in °

# TRANSITI MACCHIA ROSSA DI GIOVE

## TRANSITS OF THE RED SPOT OF JUPITER

Date	Time	Time	Time
01/01/2010	9.14.48	19.10.39	
02/01/2010	5.06.31	15.02.22	
03/01/2010	0.58.13	10.54.06	20.49.57
04/01/2010	6.45.47	16.41.38	
05/01/2010	2.37.31	12.33.22	22.29.13
06/01/2010	8.25.05	18.20.56	
07/01/2010	4.16.47	14.12.38	
08/01/2010	0.08.30	10.04.21	20.00.13
09/01/2010	5.56.04	15.51.56	
10/01/2010	1.47.47	11.43.38	21.39.30
11/01/2010	7.35.22	17.31.13	
12/01/2010	3.27.04	13.22.56	23.18.47
13/01/2010	9.14.38	19.10.29	
14/01/2010	5.06.22	15.02.13	
15/01/2010	0.58.04	10.53.56	20.49.48
16/01/2010	6.45.39	16.41.30	
17/01/2010	2.37.22	12.33.13	22.29.04
18/01/2010	8.24.57	18.20.48	
19/01/2010	4.16.39	14.12.30	
20/01/2010	0.08.23	10.04.14	20.00.05
21/01/2010	5.55.56	15.51.49	
22/01/2010	1.47.40	11.43.31	21.39.23
23/01/2010	7.35.14	17.31.05	
24/01/2010	3.26.57	13.22.49	23.18.40
25/01/2010	9.14.31	19.10.22	
26/01/2010	5.06.15	15.02.06	
27/01/2010	0.57.57	10.53.49	20.49.40
28/01/2010	6.45.31	16.41.22	
29/01/2010	2.37.15	12.33.06	22.28.57
30/01/2010	8.24.49	18.20.40	
31/01/2010	4.16.31	14.12.22	
01/02/2010	0.08.15	10.04.06	19.59.57
02/02/2010	5.55.48	15.51.40	
03/02/2010	1.47.31	11.43.22	21.39.14
04/02/2010	7.35.05	17.30.56	
05/02/2010	3.26.47	13.22.39	23.18.30
06/02/2010	9.14.21	19.10.12	
07/02/2010	5.06.04	15.01.55	
08/02/2010	0.57.46	10.53.38	20.49.29
09/02/2010	6.45.20	16.41.11	
10/02/2010	2.37.03	12.32.54	22.28.45
11/02/2010	8.24.37	18.20.27	
12/02/2010	4.16.18	14.12.09	
13/02/2010	0.08.01	10.03.52	19.59.43
14/02/2010	5.55.33	15.51.25	
15/02/2010	1.47.16	11.43.07	21.38.59
16/02/2010	7.34.49	17.30.40	
17/02/2010	3.26.31	13.22.23	23.18.13
18/02/2010	9.14.04	19.09.54	
19/02/2010	5.05.46	15.01.37	
20/02/2010	0.57.27	10.53.19	20.49.10
21/02/2010	6.45.00	16.40.51	
22/02/2010	2.36.42	12.32.33	22.28.23
23/02/2010	8.24.15	18.20.05	
24/02/2010	4.15.56	14.11.46	
25/02/2010	0.07.38	10.03.28	19.59.18
26/02/2010	5.55.09	15.51.00	
27/02/2010	1.46.50	11.42.41	21.38.32
28/02/2010	7.34.22	17.30.13	
01/03/2010	3.26.03	13.21.54	23.17.44
02/03/2010	9.13.35	19.09.25	
03/03/2010	5.05.16	15.01.06	
04/03/2010	0.56.56	10.52.47	20.48.37
05/03/2010	6.44.28	16.40.18	
06/03/2010	2.36.09	12.31.59	22.27.49
07/03/2010	8.23.39	18.19.30	
08/03/2010	4.15.20	14.11.09	
09/03/2010	0.07.00	10.02.50	19.58.40
10/03/2010	5.54.30	15.50.21	
11/03/2010	1.46.11	11.42.00	21.37.51
12/03/2010	7.33.41	17.29.30	
13/03/2010	3.25.20	13.21.11	23.17.00
14/03/2010	9.12.50	19.08.40	
15/03/2010	5.04.30	15.00.20	
16/03/2010	0.56.09	10.52.00	20.47.49
17/03/2010	6.43.39	16.39.28	
18/03/2010	2.35.19	12.31.08	22.26.57

Date	Time	Time	Time
19/03/2010	8.22.47	18.18.37	
20/03/2010	4.14.26	14.10.16	
21/03/2010	0.06.06	10.01.55	19.57.44
22/03/2010	5.53.33	15.49.24	
23/03/2010	1.45.13	11.41.02	21.36.52
24/03/2010	7.32.41	17.28.30	
25/03/2010	3.24.19	13.20.09	23.15.58
26/03/2010	9.11.47	19.07.36	
27/03/2010	5.03.26	14.59.14	
28/03/2010	0.55.03	10.50.53	20.46.42
29/03/2010	6.42.30	16.38.19	
30/03/2010	2.34.09	12.29.57	22.25.46
31/03/2010	8.21.35	18.17.24	
01/04/2010	4.13.13	14.09.01	
02/04/2010	0.04.51	10.00.39	19.56.28
03/04/2010	5.52.16	15.48.06	
04/04/2010	1.43.54	11.39.42	21.35.31
05/04/2010	7.31.20	17.27.08	
06/04/2010	3.22.56	13.18.45	23.14.34
07/04/2010	9.10.22	19.06.10	
08/04/2010	5.01.59	14.57.47	
09/04/2010	0.53.35	10.49.24	20.45.12
10/04/2010	6.41.00	16.36.48	
11/04/2010	2.32.37	12.28.24	22.24.12
12/04/2010	8.20.00	18.15.49	
13/04/2010	4.11.36	14.07.24	
14/04/2010	0.03.13	9.59.00	19.54.48
15/04/2010	5.50.36	15.46.24	
16/04/2010	1.42.12	11.37.59	21.33.47
17/04/2010	7.29.35	17.25.22	
18/04/2010	3.21.10	13.16.58	23.12.45
19/04/2010	9.08.32	19.04.20	
20/04/2010	5.00.08	14.55.55	
21/04/2010	0.51.42	10.47.29	20.43.17
22/04/2010	6.39.04	16.34.51	
23/04/2010	2.30.39	12.26.26	22.22.13
24/04/2010	8.18.00	18.13.47	
25/04/2010	4.09.34	14.05.21	
26/04/2010	0.01.09	9.56.55	19.52.42
27/04/2010	5.48.29	15.44.16	
28/04/2010	1.40.03	11.35.49	21.31.36
29/04/2010	7.27.23	17.23.10	
30/04/2010	3.18.56	13.14.43	23.10.30
01/05/2010	9.06.16	19.02.02	
02/05/2010	4.57.49	14.53.36	
03/05/2010	0.49.22	10.45.08	20.40.55
04/05/2010	6.36.41	16.32.27	
05/05/2010	2.28.14	12.24.00	22.19.46
06/05/2010	8.15.32	18.11.18	
07/05/2010	4.07.04	14.02.50	23.58.36
08/05/2010	9.54.22	19.50.08	
09/05/2010	5.45.53	15.41.40	
10/05/2010	1.37.25	11.33.11	21.28.57
11/05/2010	7.24.43	17.20.28	
12/05/2010	3.16.14	13.12.00	23.07.45
13/05/2010	9.03.30	18.59.16	
14/05/2010	4.55.01	14.50.47	
15/05/2010	0.46.32	10.42.17	20.38.03
16/05/2010	6.33.48	16.29.33	
17/05/2010	2.25.18	12.21.03	22.16.48
18/05/2010	8.12.33	18.08.18	
19/05/2010	4.04.03	13.59.48	23.55.33
20/05/2010	9.51.18	19.47.02	
21/05/2010	5.42.47	15.38.32	
22/05/2010	1.34.17	11.30.01	21.25.46
23/05/2010	7.21.30	17.17.15	
24/05/2010	3.12.59	13.08.43	23.04.28
25/05/2010	9.00.12	18.55.57	
26/05/2010	4.51.41	14.47.25	
27/05/2010	0.43.09	10.38.53	20.34.38
28/05/2010	6.30.22	16.26.06	
29/05/2010	2.21.49	12.17.34	22.13.17
30/05/2010	8.09.01	18.04.45	
31/05/2010	4.00.29	13.56.13	23.51.56
01/06/2010	9.47.40	19.43.24	
02/06/2010	5.39.07	15.34.50	
03/06/2010	1.30.34	11.26.18	21.22.01

Date	Time	Time	Time
04/06/2010	7.17.44	17.13.28	
05/06/2010	3.09.11	13.04.54	23.00.37
06/06/2010	8.56.20	18.52.03	
07/06/2010	4.47.46	14.43.29	
08/06/2010	0.39.12	10.34.55	20.30.38
09/06/2010	6.26.21	16.22.04	
10/06/2010	2.17.46	12.13.29	22.09.12
11/06/2010	8.04.54	18.00.37	
12/06/2010	3.56.19	13.52.02	23.47.44
13/06/2010	9.43.27	19.39.09	
14/06/2010	5.34.51	15.30.33	
15/06/2010	1.26.16	11.21.58	21.17.40
16/06/2010	7.13.22	17.09.04	
17/06/2010	3.04.46	13.00.28	22.56.10
18/06/2010	8.51.51	18.47.33	
19/06/2010	4.43.15	14.38.57	
20/06/2010	0.34.38	10.30.20	20.26.01
21/06/2010	6.21.43	16.17.24	
22/06/2010	2.13.06	12.08.47	22.04.28
23/06/2010	8.00.10	17.55.51	
24/06/2010	3.51.32	13.47.13	23.42.54
25/06/2010	9.38.35	19.34.16	
26/06/2010	5.29.57	15.25.38	
27/06/2010	1.21.19	11.17.00	21.12.41
28/06/2010	7.08.21	17.04.02	
29/06/2010	2.59.42	12.55.23	22.51.04
30/06/2010	8.46.44	18.42.24	
01/07/2010	4.38.05	14.33.45	
02/07/2010	0.29.25	10.25.06	20.20.46
03/07/2010	6.16.26	16.12.06	
04/07/2010	2.07.46	12.03.26	21.59.06
05/07/2010	7.54.46	17.50.26	
06/07/2010	3.46.05	13.41.45	23.37.25
07/07/2010	9.33.05	19.28.44	
08/07/2010	5.24.24	15.20.03	
09/07/2010	1.15.43	11.11.22	21.07.02
10/07/2010	7.02.41	16.58.20	
11/07/2010	2.53.59	12.49.39	22.45.18
12/07/2010	8.40.57	18.36.36	
13/07/2010	4.32.15	14.27.54	
14/07/2010	0.23.32	10.19.11	20.14.50
15/07/2010	6.10.29	16.06.08	
16/07/2010	2.01.46	11.57.25	21.53.03
17/07/2010	7.48.42	17.44.20	
18/07/2010	3.39.59	13.35.37	23.31.15
19/07/2010	9.26.54	19.22.32	
20/07/2010	5.18.10	15.13.48	
21/07/2010	1.09.26	11.05.04	21.00.42
22/07/2010	6.56.20	16.51.58	
23/07/2010	2.47.36	12.43.14	22.38.52
24/07/2010	8.34.29	18.30.07	
25/07/2010	4.25.45	14.21.22	
26/07/2010	0.17.00	10.12.37	20.08.15
27/07/2010	6.03.52	15.59.29	
28/07/2010	1.55.07	11.50.44	21.46.21
29/07/2010	7.41.58	17.37.36	
30/07/2010	3.33.13	13.28.50	23.24.27
31/07/2010	9.20.04	19.15.41	
01/08/2010	5.11.18	15.06.54	
02/08/2010	1.02.31	10.58.08	20.53.45
03/08/2010	6.49.22	16.44.58	
04/08/2010	2.40.35	12.36.11	22.31.48
05/08/2010	8.27.24	18.23.01	
06/08/2010	4.18.37	14.14.14	
07/08/2010	0.09.50	10.05.26	20.01.02
08/08/2010	5.56.39	15.52.15	
09/08/2010	1.47.51	11.43.27	21.39.03
10/08/2010	7.34.39	17.30.15	
11/08/2010	3.25.51	13.21.27	23.17.03
12/08/2010	9.12.39	19.08.15	
13/08/2010	5.03.50	14.59.26	
14/08/2010	0.55.02	10.50.37	20.46.13
15/08/2010	6.41.49	16.37.24	
16/08/2010	2.33.00	12.28.35	22.24.11
17/08/2010	8.19.47	18.15.22	
18/08/2010	4.10.57	14.06.33	
19/08/2010	0.02.08	9.57.43	19.53.31

Date	Time	Time	Time
20/08/2010	5.48.54	15.44.29	
21/08/2010	1.40.04	11.35.40	21.31.15
22/08/2010	7.26.50	17.22.25	
23/08/2010	3.18.00	13.13.35	23.09.10
24/08/2010	9.04.45	19.00.21	
25/08/2010	4.55.55	14.51.30	
26/08/2010	0.47.06	10.42.41	20.38.15
27/08/2010	6.33.50	16.29.25	
28/08/2010	2.25.00	12.20.35	22.16.10
29/08/2010	8.11.45	18.07.19	
30/08/2010	4.02.54	13.58.29	23.54.04
31/08/2010	9.49.39	19.45.14	
01/09/2010	5.40.48	15.36.23	
02/09/2010	1.31.58	11.27.33	21.23.08
03/09/2010	7.18.42	17.14.17	
04/09/2010	3.09.52	13.05.27	23.01.01
05/09/2010	8.56.36	18.52.11	
06/09/2010	4.47.45	14.43.20	
07/09/2010	0.38.54	10.34.29	20.30.04
08/09/2010	6.25.38	16.21.13	
09/09/2010	2.16.48	12.12.23	22.07.57
10/09/2010	8.03.32	17.59.07	
11/09/2010	3.54.42	13.50.16	23.45.51
12/09/2010	9.41.26	19.37.01	
13/09/2010	5.32.36	15.28.11	
14/09/2010	1.23.45	11.19.20	21.14.55
15/09/2010	7.10.30	17.06.04	
16/09/2010	3.01.40	12.57.15	22.52.49
17/09/2010	8.48.24	18.43.59	
18/09/2010	4.39.34	14.35.09	
19/09/2010	0.30.44	10.26.19	20.21.55
20/09/2010	6.17.29	16.13.05	
21/09/2010	2.08.40	12.04.15	21.59.50
22/09/2010	7.55.25	17.51.01	
23/09/2010	3.46.36	13.42.11	23.37.47
24/09/2010	9.33.22	19.28.57	
25/09/2010	5.24.33	15.20.08	
26/09/2010	1.15.43	11.11.19	21.06.55
27/09/2010	7.02.31	16.58.06	
28/09/2010	2.53.42	12.49.17	22.44.53
29/09/2010	8.40.29	18.36.05	
30/09/2010	4.31.41	14.27.16	
01/10/2010	0.22.52	10.18.28	20.14.05
02/10/2010	6.09.40	16.05.17	
03/10/2010	2.00.53	11.56.29	21.52.05

Date	Time	Time	Time
04/10/2010	7.47.42	17.43.18	
05/10/2010	3.38.54	13.34.31	23.30.07
06/10/2010	9.25.44	19.21.20	
07/10/2010	5.16.57	15.12.34	
08/10/2010	1.08.11	11.03.47	20.59.24
09/10/2010	6.55.01	16.50.38	
10/10/2010	2.46.15	12.41.52	22.37.29
11/10/2010	8.33.06	18.28.43	
12/10/2010	4.24.21	14.19.58	
13/10/2010	0.15.35	10.11.13	20.06.51
14/10/2010	6.02.28	15.58.06	
15/10/2010	1.53.44	11.49.21	21.44.59
16/10/2010	7.40.37	17.36.15	
17/10/2010	3.31.53	13.27.31	23.23.09
18/10/2010	9.18.47	19.14.25	
19/10/2010	5.10.04	15.05.42	
20/10/2010	1.01.21	10.56.59	20.52.38
21/10/2010	6.48.17	16.43.55	
22/10/2010	2.39.34	12.35.13	22.30.52
23/10/2010	8.26.31	18.22.10	
24/10/2010	4.17.49	14.13.28	
25/10/2010	0.09.07	10.04.47	20.00.26
26/10/2010	5.56.06	15.51.45	
27/10/2010	1.47.25	11.43.05	21.38.44
28/10/2010	7.34.24	17.30.04	
29/10/2010	3.25.44	13.21.24	23.17.04
30/10/2010	9.12.44	19.08.24	
31/10/2010	5.04.05	14.59.45	
01/11/2010	0.55.26	10.51.06	20.46.47
02/11/2010	6.42.27	16.38.08	
03/11/2010	2.33.49	12.29.30	22.25.11
04/11/2010	8.20.52	18.16.33	
05/11/2010	4.12.14	14.07.55	
06/11/2010	0.03.37	9.59.18	19.54.59
07/11/2010	5.50.41	15.46.23	
08/11/2010	1.42.04	11.37.46	21.33.28
09/11/2010	7.29.10	17.24.52	
10/11/2010	3.20.34	13.16.16	23.11.58
11/11/2010	9.07.40	19.03.22	
12/11/2010	4.59.05	14.54.47	
13/11/2010	0.50.30	10.46.12	20.41.55
14/11/2010	6.37.38	16.33.21	
15/11/2010	2.29.04	12.24.47	22.20.30
16/11/2010	8.16.13	18.11.56	
17/11/2010	4.07.39	14.03.23	23.59.06

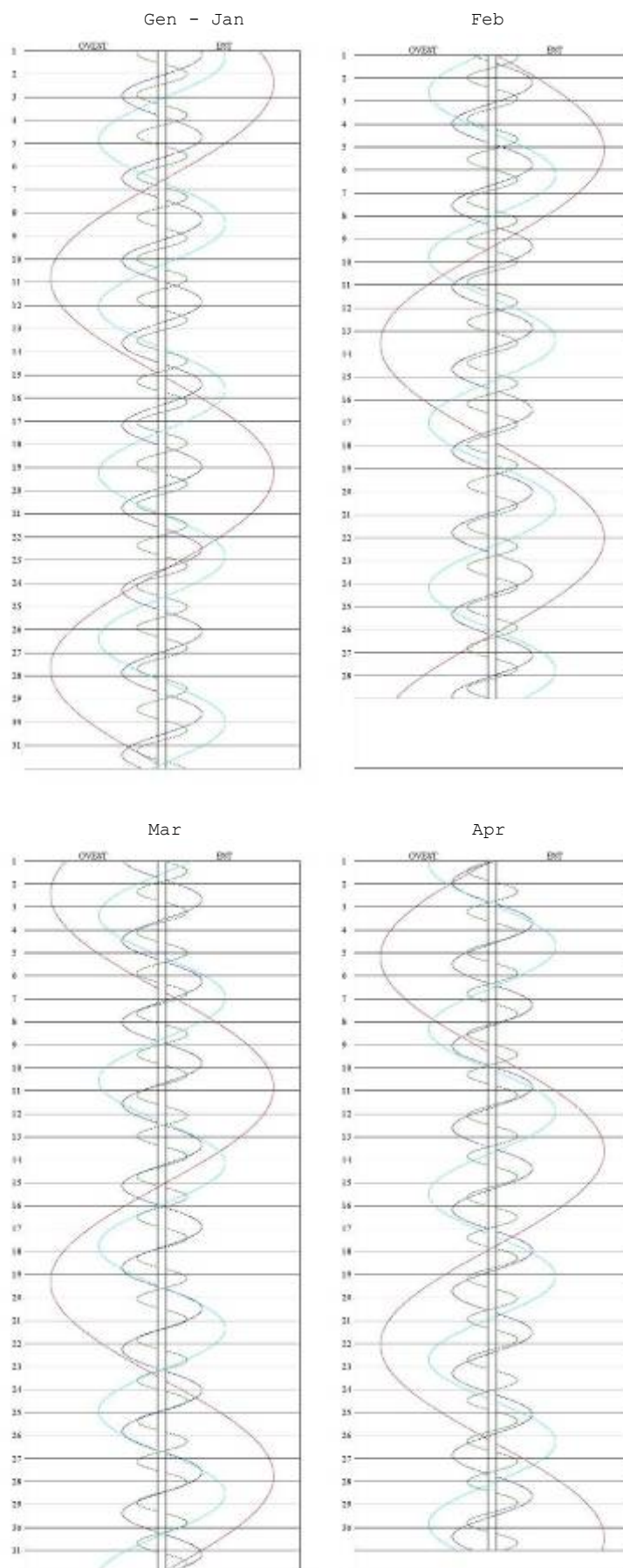
Date	Time	Time	Time
18/11/2010	9.54.50	19.50.33	
19/11/2010	5.46.16	15.42.00	
20/11/2010	1.37.44	11.33.28	21.29.12
21/11/2010	7.24.56	17.20.40	
22/11/2010	3.16.24	13.12.08	23.07.52
23/11/2010	9.03.36	18.59.21	
24/11/2010	4.55.05	14.50.50	
25/11/2010	0.46.34	10.42.19	20.38.04
26/11/2010	6.33.48	16.29.33	
27/11/2010	2.25.18	12.21.03	22.16.48
28/11/2010	8.12.33	18.08.18	
29/11/2010	4.04.03	13.59.48	23.55.34
30/11/2010	9.51.19	19.47.05	
01/12/2010	5.42.50	15.38.36	
02/12/2010	1.34.22	11.30.07	21.25.53
03/12/2010	7.21.39	17.17.25	
04/12/2010	3.13.11	13.08.56	23.04.43
05/12/2010	9.00.29	18.56.15	
06/12/2010	4.52.02	14.47.48	
07/12/2010	0.43.34	10.39.20	20.35.07
08/12/2010	6.30.54	16.26.40	
09/12/2010	2.22.26	12.18.14	22.14.00
10/12/2010	8.09.47	18.05.34	
11/12/2010	4.01.21	13.57.08	23.52.55
12/12/2010	9.48.42	19.44.29	
13/12/2010	5.40.16	15.36.04	
14/12/2010	1.31.51	11.27.39	21.23.26
15/12/2010	7.19.14	17.15.01	
16/12/2010	3.10.48	13.06.36	23.02.24
17/12/2010	8.58.12	18.53.59	
18/12/2010	4.49.48	14.45.35	
19/12/2010	0.41.23	10.37.11	20.33.00
20/12/2010	6.28.47	16.24.35	
21/12/2010	2.20.23	12.16.12	22.12.00
22/12/2010	8.07.48	18.03.37	
23/12/2010	3.59.25	13.55.14	23.51.02
24/12/2010	9.46.51	19.42.39	
25/12/2010	5.38.28	15.34.16	
26/12/2010	1.30.06	11.25.54	21.21.43
27/12/2010	7.17.32	17.13.21	
28/12/2010	3.09.09	13.04.58	23.00.48
29/12/2010	8.56.37	18.52.25	
30/12/2010	4.48.15	14.44.04	
31/12/2010	0.39.53	10.35.42	20.31.32

Orari in T.U. in cui transita la grande macchia rossa

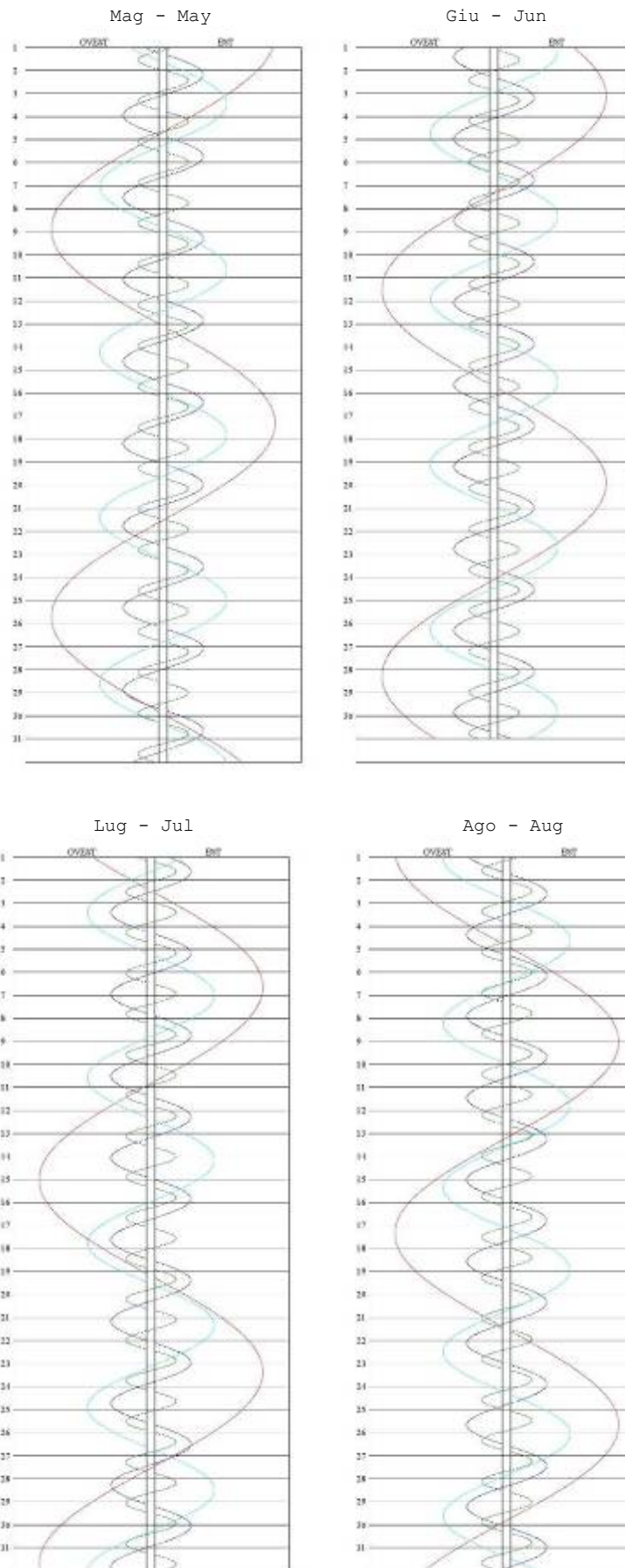
Date in the format dd/mm/yyyy

TIMES IN U.T.

# POSIZIONE DEI SATELLITI DI GIOVE POSITION OF THE SATELLITES OF JUPITER

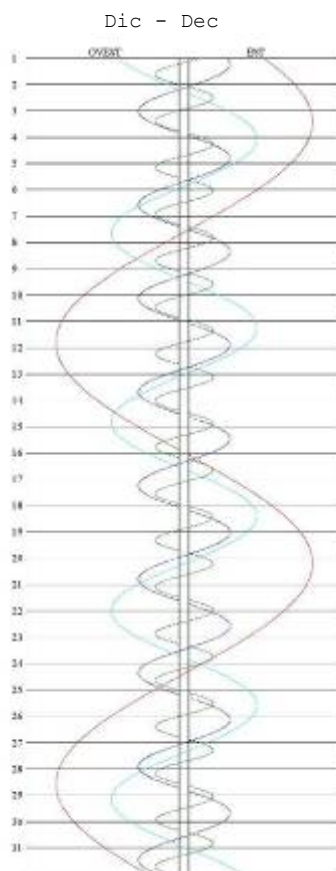
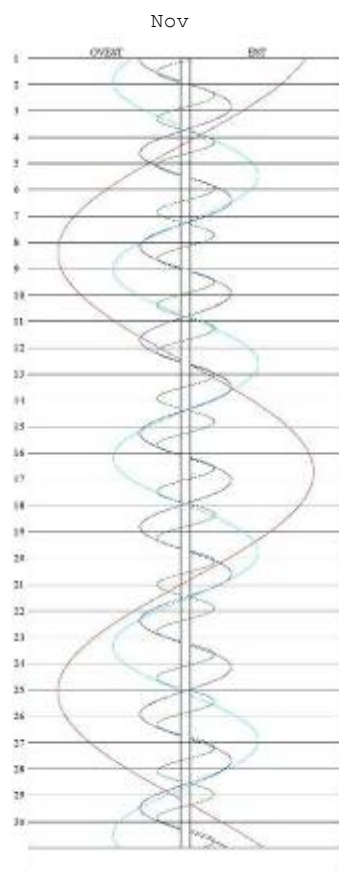
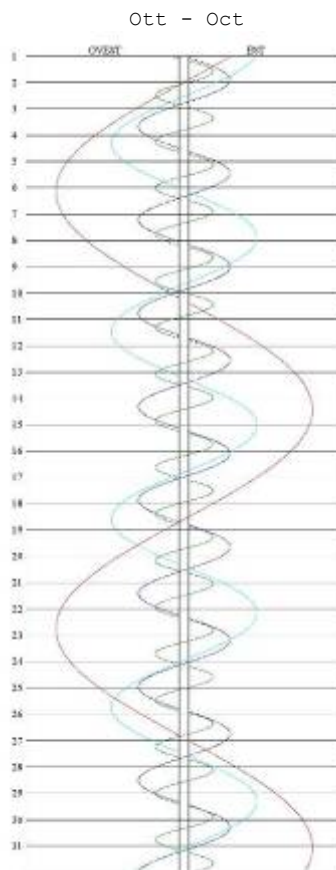
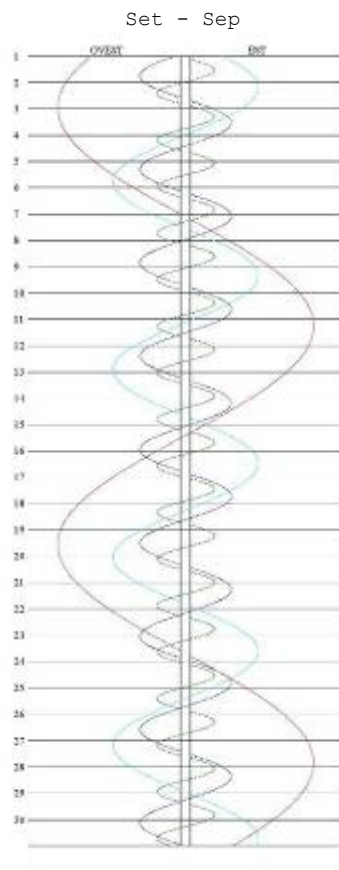


In verde Io, in blu Europa, in azzurro Ganimede, in rosso Callisto  
In green Io, in blue Europa, in blue light Ganimede, in red Callisto



In verde Io, in blu Europa, in azzurro Ganimede, in rosso Callisto  
 In green Io, in blue Europa, in blue light Ganimede, in red Callisto





In verde Io, in blu Europa, in azzurro Ganimede, in rosso Callisto  
 In green Io, in blue Europa, in blue light Ganymede, in red Callisto

# EFFEMERIDI DI SATURNO - EPHEMERIDES OF SATURN

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq.°	Diam. Pol.°	Mag.	Phase angle°	Max °	Min °	B °	Rise	Trans.	Set.
01/01/2010	12h 20m 10.44s	+00° 18' 33.0"	9.475105	9.322659	77.53	95.9	17.8	15.8	0.9	5.9	40.3	3.4	4.9	22.34	4.59	11.19
02/01/2010	12h 20m 15.76s	+00° 18' 17.3"	9.475406	9.306177	77.40	96.9	17.8	15.9	0.9	5.9	40.3	3.4	4.9	22.30	4.55	11.15
03/01/2010	12h 20m 20.68s	+00° 18' 04.0"	9.475707	9.289729	77.26	97.9	17.8	15.9	0.9	5.9	40.4	3.5	4.9	22.26	4.51	11.11
04/01/2010	12h 20m 25.21s	+00° 17' 53.5"	9.476008	9.273321	77.12	98.9	17.8	15.9	0.8	5.9	40.5	3.5	4.9	22.22	4.47	11.08
05/01/2010	12h 20m 29.33s	+00° 17' 45.5"	9.476309	9.256956	76.99	99.9	17.9	16.0	0.8	5.9	40.5	3.5	4.9	22.18	4.43	11.04
06/01/2010	12h 20m 33.05s	+00° 17' 40.1"	9.476610	9.240640	76.85	100.9	17.9	16.0	0.8	5.8	40.6	3.5	4.9	22.14	4.39	11.00
07/01/2010	12h 20m 36.38s	+00° 17' 37.3"	9.476911	9.224377	76.72	101.9	17.9	16.0	0.8	5.8	40.7	3.5	4.9	22.10	4.35	10.56
08/01/2010	12h 20m 39.31s	+00° 17' 37.1"	9.477212	9.208173	76.58	103.0	18.0	16.0	0.8	5.8	40.8	3.5	4.9	22.06	4.31	10.52
09/01/2010	12h 20m 41.84s	+00° 17' 39.5"	9.477513	9.192034	76.45	104.0	18.0	16.1	0.8	5.8	40.8	3.5	4.9	22.02	4.27	10.48
10/01/2010	12h 20m 43.97s	+00° 17' 44.5"	9.477814	9.175964	76.31	105.0	18.0	16.1	0.8	5.8	40.9	3.5	4.9	21.58	4.23	10.44
11/01/2010	12h 20m 45.70s	+00° 17' 52.1"	9.478115	9.159969	76.18	106.0	18.1	16.1	0.8	5.7	41.0	3.5	4.9	21.54	4.19	10.40
12/01/2010	12h 20m 47.03s	+00° 18' 02.3"	9.478416	9.144054	76.05	107.0	18.1	16.2	0.8	5.7	41.0	3.5	4.9	21.50	4.15	10.36
13/01/2010	12h 20m 47.95s	+00° 18' 15.0"	9.478717	9.128225	75.92	108.0	18.1	16.2	0.8	5.7	41.1	3.5	4.9	21.46	4.11	10.32
14/01/2010	12h 20m 48.47s	+00° 18' 30.4"	9.479018	9.112487	75.79	109.0	18.2	16.2	0.8	5.6	41.2	3.5	4.9	21.42	4.07	10.28
15/01/2010	12h 20m 48.59s	+00° 18' 48.3"	9.479320	9.096845	75.66	110.1	18.2	16.2	0.8	5.6	41.3	3.5	4.9	21.38	4.03	10.24
16/01/2010	12h 20m 48.30s	+00° 19' 08.8"	9.479621	9.081306	75.53	111.1	18.2	16.3	0.8	5.6	41.3	3.5	4.9	21.34	3.99	10.20
17/01/2010	12h 20m 47.60s	+00° 19' 31.9"	9.479922	9.065875	75.40	112.1	18.3	16.3	0.8	5.5	41.4	3.5	4.9	21.30	3.55	10.16
18/01/2010	12h 20m 46.50s	+00° 19' 57.5"	9.480223	9.050556	75.27	113.1	18.3	16.3	0.8	5.5	41.5	3.5	4.9	21.26	3.51	10.12
19/01/2010	12h 20m 45.00s	+00° 20' 25.7"	9.480524	9.035355	75.14	114.2	18.3	16.3	0.8	5.4	41.5	3.5	4.9	21.22	3.47	10.08
20/01/2010	12h 20m 43.10s	+00° 20' 56.4"	9.480825	9.020278	75.02	115.2	18.3	16.4	0.8	5.4	41.6	3.5	4.9	21.18	3.43	10.04
21/01/2010	12h 20m 40.80s	+00° 21' 29.6"	9.481127	9.005330	74.89	116.2	18.4	16.4	0.8	5.3	41.7	3.5	4.9	21.13	3.39	10.00
22/01/2010	12h 20m 38.10s	+00° 22' 05.3"	9.481428	8.990515	74.77	117.2	18.4	16.4	0.8	5.3	41.7	3.5	4.8	21.09	3.35	9.56
23/01/2010	12h 20m 35.01s	+00° 22' 43.5"	9.481729	8.975839	74.65	118.3	18.4	16.5	0.8	5.2	41.8	3.5	4.8	21.05	3.31	9.52
24/01/2010	12h 20m 31.53s	+00° 23' 24.1"	9.482030	8.961307	74.53	119.3	18.5	16.5	0.8	5.2	41.9	3.5	4.8	21.01	3.27	9.48
25/01/2010	12h 20m 27.67s	+00° 24' 07.0"	9.482331	8.946923	74.41	120.3	18.5	16.5	0.8	5.1	42.0	3.5	4.8	20.57	3.23	9.44
26/01/2010	12h 20m 23.42s	+00° 24' 52.4"	9.482633	8.932692	74.29	121.4	18.5	16.5	0.8	5.1	42.0	3.5	4.8	20.53	3.18	9.40
27/01/2010	12h 20m 18.79s	+00° 25' 40.1"	9.482934	8.918620	74.17	122.4	18.6	16.6	0.7	5.0	42.1	3.5	4.8	20.48	3.14	9.36
28/01/2010	12h 20m 13.79s	+00° 26' 30.1"	9.483235	8.904709	74.06	123.5	18.6	16.6	0.7	5.0	42.2	3.5	4.8	20.44	3.10	9.32
29/01/2010	12h 20m 08.40s	+00° 27' 22.5"	9.483537	8.890966	73.94	124.5	18.6	16.6	0.7	4.9	42.2	3.5	4.7	20.40	3.06	9.28
30/01/2010	12h 20m 02.63s	+00° 28' 17.2"	9.483838	8.877393	73.83	125.5	18.6	16.6	0.7	4.8	42.3	3.5	4.7	20.36	3.02	9.24
31/01/2010	12h 19m 56.49s	+00° 29' 14.2"	9.484139	8.863996	73.72	126.6	18.7	16.7	0.7	4.8	42.3	3.5	4.7	20.32	2.58	9.20
01/02/2010	12h 19m 49.97s	+00° 30' 13.5"	9.484441	8.850778	73.61	127.6	18.7	16.7	0.7	4.7	42.4	3.5	4.7	20.27	2.54	9.16
02/02/2010	12h 19m 43.08s	+00° 31' 15.0"	9.484742	8.837745	73.50	128.7	18.7	16.7	0.7	4.7	42.5	3.5	4.7	20.23	2.50	9.12
03/02/2010	12h 19m 35.82s	+00° 32' 18.8"	9.485043	8.824900	73.39	129.7	18.8	16.7	0.7	4.6	42.5	3.5	4.7	20.19	2.46	9.08
04/02/2010	12h 19m 28.21s	+00° 33' 24.7"	9.485345	8.812248	73.29	130.8	18.8	16.8	0.7	4.5	42.6	3.4	4.6	20.15	2.41	9.04
05/02/2010	12h 19m 20.23s	+00° 34' 32.8"	9.485646	8.799794	73.19	131.8	18.8	16.8	0.7	4.4	42.7	3.4	4.6	20.11	2.37	9.00
06/02/2010	12h 19m 11.91s	+00° 35' 43.0"	9.485947	8.787542	73.08	132.9	18.8	16.8	0.7	4.4	42.7	3.4	4.6	20.06	2.33	8.56
07/02/2010	12h 19m 03.24s	+00° 36' 55.3"	9.486249	8.775497	72.98	133.9	18.9	16.8	0.7	4.3	42.8	3.4	4.6	20.02	2.29	8.52
08/02/2010	12h 18m 54.23s	+00° 38' 09.6"	9.486550	8.763663	72.88	135.0	18.9	16.9	0.7	4.2	42.8	3.4	4.5	19.58	2.25	8.48
09/02/2010	12h 18m 44.87s	+00° 39' 26.0"	9.486852	8.752046	72.79	136.0	18.9	16.9	0.7	4.1	42.9	3.4	4.5	19.54	2.21	8.44
10/02/2010	12h 18m 35.18s	+00° 40' 44.3"	9.487153	8.740650	72.69	137.1	18.9	16.9	0.7	4.1	42.9	3.4	4.5	19.49	2.17	8.40
11/02/2010	12h 18m 25.15s	+00° 42' 04.6"	9.487455	8.729479	72.60	138.1	19.0	16.9	0.7	4.0	43.0	3.4	4.5	19.45	2.12	8.36
12/02/2010	12h 18m 14.79s	+00° 43' 26.8"	9.487756	8.718537	72.51	139.2	19.0	16.9	0.7	3.9	43.1	3.3	4.5	19.41	2.08	8.32
13/02/2010	12h 18m 04.11s	+00° 44' 50.9"	9.488057	8.707830	72.42	140.3	19.0	17.0	0.7	3.8	43.1	3.3	4.4	19.36	2.04	8.27
14/02/2010	12h 17m 53.11s	+00° 46' 16.8"	9.488359	8.697360	72.33	141.3	19.0	17.0	0.7	3.7	43.2	3.3	4.4	19.32	2.00	8.23
15/02/2010	12h 17m 41.80s	+00° 47' 44.5"	9.488660	8.687132	72.25	142.4	19.1	17.0	0.7	3.6	43.2	3.3	4.4	19.28	1.56	8.19
16/02/2010	12h 17m 30.19s	+00° 49' 13.9"	9.488962	8.677150	72.17	143.4	19.1	17.0	0.7	3.6	43.3	3.3	4.3	19.24	1.52	8.15
17/02/2010	12h 17m 18.28s	+00° 50' 45.0"	9.489264	8.667418	72.08	144.5	19.1	17.0	0.6	3.5	43.3	3.3	4.3	19.19	1.47	8.11
18/02/2010	12h 17m 06.08s	+00° 52' 17.7"	9.489565	8.657940	72.01	145.6	19.1	17.1	0.6	3.4	43.4	3.2	4.3	19.15	1.43	8.07
19/02/2010	12h 16m 53.59s	+00° 53' 52.0"	9.489867	8.648718	71.93	146.6	19.1	17.1	0.6	3.3	43.4	3.2	4.3	19.11	1.39	8.03
20/02/2010	12h 16m 40.84s	+00° 55' 27.9"	9.490168	8.639756	71.85	147.7	19.2	17.1	0.6	3.2	43.4	3.2	4.2	19.06	1.35	7.59
21/02/2010	12h 16m 27.81s	+00° 57' 05.1"	9.490470	8.631058	71.78	148.8	19.2	17.1	0.6	3.1	43.5	3.2	4.2	19.02	1.31	7.55
22/02/2010	12h 16m 14.53s	+00° 58' 43.8"	9.490771	8.622626	71.71	149.8	19.2	17.1	0.6	3.0	43.5	3.2	4.2	18.58	1.26	7.51
23/02/2010	12h 16m 01.00s	+01° 00' 23.7"	9.491073	8.614464	71.64	150.9	19.2	17.1	0.6	2.9	43.6	3.1	4.1	18.53	1.22	7.47
24/02/2010	12h 15m 47.23s	+01° 02' 05.0"	9.491374	8.606573	71.58	152.0	19.2	17.2	0.6	2.8	43.6	3.1	4.1	18.49	1.18	7.43
25/02/2010	12h 15m 33.22s	+01° 03' 47.6"	9.491676	8.598957	71.52	153.0	19.2	17.2	0.6	2.7	43.7	3.1	4.1	18.45	1.14	7.38
26/02/2010	12h 15m 18.97s	+01° 05' 31.3"	9.491978	8.591618	71.45	154.1	19.3	17.2	0.6	2.6	43.7	3.1	4.0	18.40	1.10	7.34
27/02/2010	12h 15m 04.50s	+01° 07' 16.2"	9.492279	8.584557	71.40	155.2	19.3	17.2	0.6	2.5	43.7	3.1	4.0	18.36	1.05	7.30
28/02/2010	12h 14m 49.81s	+01° 09' 02.3"	9.492581	8.577778	71.34	156.2	19.3	17.2	0.6	2.4	43.8	3.0	4.0	18.32	1.01	7.26
01/03/2010	12h 14m 34.91s	+01° 10' 49.4"	9.492883	8.571283	71.28	157.3	19.3	17.2	0.6	2.3	43.8	3.0	3.9	18.27	0.57	7.22
02/03/2010	12h 14m 19.81s	+01° 12' 37.5"	9.493184	8.565073	71.23	158.3	19.3	17.2	0.6	2.2	43.8	3.0	3.9	18.23	0.53	7.18
03/03/2010	12h 14m 04.51s	+01° 14' 26.5"	9.493486	8.559151	71.18	159.4	19.3	17.3	0.6	2.1	43.9	3.0	3.9	18.19	0.48	7.14
04/03/2010	12h 13m 49.04s	+01° 16' 16.5"	9.493788	8.553519	71.14	160.5	19.3	17.3	0.6	2.0	43.9	2.9	3.8	18.14	0.44	7.10
05/03/2010	12h 13m 33.38s	+01° 18' 07.2"	9.494089	8.548179	71.09	161.5	19.4	17.3	0.6	1.9	43.9	2.9	3.8	18.10	0.40	7.06
06/03/2010	12h 13m 17.57s															

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq.*	Diam. Pol.*	Mag.	Phase angle*	Max °	Min °	B °	Rise	Trans.	Set.
09/04/2010	12h 03m 45.66s	+02° 23' 18.7"	9.504653	8.553723	71.14	160.7	19.3	17.3	0.6	2.0	43.9	1.9	2.5	15.39	22.09	4.42
10/04/2010	12h 03m 29.79s	+02° 24' 58.0"	9.504955	8.559327	71.19	159.7	19.3	17.3	0.6	2.1	43.9	1.9	2.5	15.35	22.05	4.38
11/04/2010	12h 03m 14.07s	+02° 26' 36.0"	9.505257	8.565220	71.23	158.6	19.3	17.2	0.6	2.2	43.8	1.9	2.5	15.31	22.00	4.34
12/04/2010	12h 02m 58.53s	+02° 28' 12.5"	9.505559	8.571397	71.29	157.6	19.3	17.2	0.7	2.3	43.8	1.9	2.4	15.27	21.56	4.30
13/04/2010	12h 02m 43.16s	+02° 29' 47.6"	9.505861	8.577858	71.34	156.5	19.3	17.2	0.7	2.4	43.8	1.8	2.4	15.23	21.52	4.26
14/04/2010	12h 02m 27.98s	+02° 31' 21.1"	9.506163	8.584600	71.40	155.5	19.3	17.2	0.7	2.5	43.7	1.8	2.4	15.18	21.48	4.22
15/04/2010	12h 02m 13.00s	+02° 32' 53.0"	9.506465	8.591619	71.45	154.4	19.3	17.2	0.7	2.6	43.7	1.8	2.3	15.14	21.44	4.18
16/04/2010	12h 01m 58.22s	+02° 34' 23.3"	9.506767	8.598914	71.51	153.4	19.2	17.2	0.7	2.7	43.7	1.8	2.3	15.10	21.40	4.14
17/04/2010	12h 01m 43.66s	+02° 35' 51.8"	9.507069	8.606481	71.58	152.4	19.2	17.2	0.7	2.8	43.6	1.7	2.3	15.06	21.36	4.10
18/04/2010	12h 01m 29.32s	+02° 37' 18.6"	9.507370	8.614316	71.64	151.3	19.2	17.1	0.7	2.9	43.6	1.7	2.3	15.02	21.32	4.06
19/04/2010	12h 01m 15.20s	+02° 38' 43.6"	9.507672	8.622417	71.71	150.3	19.2	17.1	0.7	3.0	43.5	1.7	2.2	14.97	21.27	4.02
20/04/2010	12h 01m 01.32s	+02° 40' 06.8"	9.507974	8.630780	71.78	149.3	19.2	17.1	0.7	3.1	43.5	1.7	2.2	14.93	21.23	3.98
21/04/2010	12h 00m 47.68s	+02° 41' 28.2"	9.508276	8.639402	71.85	148.2	19.2	17.1	0.7	3.2	43.4	1.7	2.2	14.89	21.19	3.94
22/04/2010	12h 00m 34.29s	+02° 42' 47.6"	9.508578	8.648278	71.93	147.2	19.1	17.1	0.7	3.3	43.4	1.6	2.2	14.85	21.15	3.90
23/04/2010	12h 00m 21.14s	+02° 44' 05.2"	9.508880	8.657406	72.00	146.2	19.1	17.1	0.7	3.4	43.4	1.6	2.1	14.81	21.11	3.86
24/04/2010	12h 00m 08.25s	+02° 45' 20.8"	9.509182	8.666781	72.08	145.1	19.1	17.0	0.7	3.5	43.3	1.6	2.1	14.77	21.07	3.82
25/04/2010	11h 59m 55.62s	+02° 46' 34.5"	9.509484	8.676400	72.16	144.1	19.1	17.0	0.7	3.6	43.3	1.6	2.1	14.73	21.03	3.78
26/04/2010	11h 59m 43.26s	+02° 47' 46.2"	9.509786	8.686258	72.24	143.1	19.1	17.0	0.8	3.6	43.2	1.5	2.1	14.68	20.99	3.74
27/04/2010	11h 59m 31.18s	+02° 48' 55.8"	9.510088	8.696354	72.33	142.0	19.0	17.0	0.8	3.7	43.2	1.5	2.0	14.64	20.95	3.70
28/04/2010	11h 59m 19.38s	+02° 50' 03.3"	9.510390	8.706682	72.41	141.0	19.0	17.0	0.8	3.8	43.1	1.5	2.0	14.60	20.91	3.66
29/04/2010	11h 59m 07.86s	+02° 51' 08.7"	9.510692	8.717240	72.50	140.0	19.0	16.9	0.8	3.9	43.1	1.5	2.0	14.56	20.87	3.62
30/04/2010	11h 58m 56.64s	+02° 52' 11.9"	9.510994	8.728024	72.59	139.0	19.0	16.9	0.8	4.0	43.0	1.5	2.0	14.52	20.83	3.58
01/05/2010	11h 58m 45.72s	+02° 53' 13.0"	9.511296	8.739030	72.68	138.0	18.9	16.9	0.8	4.1	43.0	1.5	1.9	14.48	20.79	3.54
02/05/2010	11h 58m 35.10s	+02° 54' 11.9"	9.511598	8.750255	72.77	137.0	18.9	16.9	0.8	4.1	42.9	1.4	1.9	14.44	20.75	3.50
03/05/2010	11h 58m 24.79s	+02° 55' 08.7"	9.511900	8.761695	72.87	135.9	18.9	16.9	0.8	4.2	42.8	1.4	1.9	14.40	20.71	3.46
04/05/2010	11h 58m 14.78s	+02° 56' 03.1"	9.512202	8.773348	72.97	134.9	18.9	16.8	0.8	4.3	42.8	1.4	1.9	14.36	20.67	3.42
05/05/2010	11h 58m 05.09s	+02° 56' 55.4"	9.512504	8.785208	73.06	133.9	18.8	16.8	0.8	4.4	42.7	1.4	1.9	14.32	20.63	3.38
06/05/2010	11h 57m 55.71s	+02° 57' 45.4"	9.512806	8.797272	73.16	132.9	18.8	16.8	0.8	4.5	42.7	1.4	1.9	14.28	20.59	3.34
07/05/2010	11h 57m 46.65s	+02° 58' 33.0"	9.513108	8.809537	73.27	131.9	18.8	16.8	0.8	4.5	42.6	1.4	1.8	14.24	20.55	3.30
08/05/2010	11h 57m 37.92s	+02° 59' 18.4"	9.513410	8.821997	73.37	130.9	18.8	16.7	0.8	4.6	42.5	1.4	1.8	14.20	20.51	3.26
09/05/2010	11h 57m 29.52s	+03° 00' 01.5"	9.513712	8.834650	73.48	129.9	18.7	16.7	0.8	4.7	42.5	1.3	1.8	14.16	20.47	3.22
10/05/2010	11h 57m 21.45s	+03° 00' 42.2"	9.514014	8.847491	73.58	128.9	18.7	16.7	0.8	4.7	42.4	1.3	1.8	14.12	20.43	3.18
11/05/2010	11h 57m 13.73s	+03° 01' 20.5"	9.514316	8.860516	73.69	127.9	18.7	16.7	0.8	4.8	42.4	1.3	1.8	14.08	20.39	3.14
12/05/2010	11h 57m 06.35s	+03° 01' 56.3"	9.514618	8.873720	73.80	126.9	18.7	16.6	0.9	4.9	42.3	1.3	1.8	14.04	20.35	3.10
13/05/2010	11h 56m 59.32s	+03° 02' 29.8"	9.514920	8.887099	73.91	125.9	18.6	16.6	0.9	4.9	42.2	1.3	1.8	14.00	20.31	3.06
14/05/2010	11h 56m 52.64s	+03° 03' 00.8"	9.515222	8.900649	74.02	124.9	18.6	16.6	0.9	5.0	42.2	1.3	1.7	13.96	20.27	3.02
15/05/2010	11h 56m 46.32s	+03° 03' 29.3"	9.515524	8.914364	74.14	123.9	18.6	16.6	0.9	5.1	42.1	1.3	1.7	13.92	20.23	2.98
16/05/2010	11h 56m 40.36s	+03° 03' 55.3"	9.515826	8.928240	74.25	122.9	18.5	16.5	0.9	5.1	42.0	1.3	1.7	13.88	20.19	2.94
17/05/2010	11h 56m 34.76s	+03° 04' 18.9"	9.516128	8.942272	74.37	121.9	18.5	16.5	0.9	5.2	42.0	1.3	1.7	13.84	20.15	2.90
18/05/2010	11h 56m 29.51s	+03° 04' 40.0"	9.516430	8.956456	74.49	121.0	18.5	16.5	0.9	5.2	41.9	1.3	1.7	13.80	20.11	2.86
19/05/2010	11h 56m 24.64s	+03° 04' 58.6"	9.516732	8.970785	74.61	120.0	18.4	16.5	0.9	5.3	41.8	1.2	1.7	13.76	20.07	2.82
20/05/2010	11h 56m 20.12s	+03° 05' 14.7"	9.517034	8.985257	74.73	119.0	18.4	16.4	0.9	5.3	41.8	1.2	1.7	13.72	20.03	2.78
21/05/2010	11h 56m 15.97s	+03° 05' 28.4"	9.517336	8.999864	74.85	118.0	18.4	16.4	0.9	5.4	41.7	1.2	1.7	13.68	20.00	2.74
22/05/2010	11h 56m 12.18s	+03° 05' 39.6"	9.517638	9.014603	74.97	117.0	18.4	16.4	0.9	5.4	41.6	1.2	1.7	13.64	19.96	2.70
23/05/2010	11h 56m 08.76s	+03° 05' 48.3"	9.517940	9.029470	75.10	116.1	18.3	16.4	0.9	5.5	41.6	1.2	1.7	13.60	19.92	2.66
24/05/2010	11h 56m 05.71s	+03° 05' 54.6"	9.518242	9.044458	75.22	115.1	18.3	16.3	0.9	5.5	41.5	1.2	1.7	13.56	19.88	2.62
25/05/2010	11h 56m 03.03s	+03° 05' 58.3"	9.518544	9.059565	75.35	114.1	18.3	16.3	0.9	5.6	41.4	1.2	1.7	13.52	19.84	2.58
26/05/2010	11h 56m 00.72s	+03° 05' 59.5"	9.518846	9.074785	75.47	113.2	18.2	16.3	0.9	5.6	41.4	1.2	1.7	13.48	19.80	2.54
27/05/2010	11h 55m 58.79s	+03° 05' 58.3"	9.519148	9.090114	75.60	112.2	18.2	16.2	0.9	5.7	41.3	1.2	1.7	13.44	19.76	2.50
28/05/2010	11h 55m 57.23s	+03° 05' 54.5"	9.519450	9.105548	75.73	111.2	18.2	16.2	0.9	5.7	41.2	1.2	1.7	13.40	19.72	2.46
29/05/2010	11h 55m 56.05s	+03° 05' 48.2"	9.519752	9.121083	75.86	110.3	18.1	16.2	0.9	5.7	41.2	1.2	1.7	13.36	19.68	2.42
30/05/2010	11h 55m 55.24s	+03° 05' 39.5"	9.520054	9.136714	75.99	109.3	18.1	16.2	1.0	5.8	41.1	1.2	1.7	13.32	19.64	2.38
31/05/2010	11h 55m 54.81s	+03° 05' 28.3"	9.520356	9.152437	76.12	108.3	18.1	16.1	1.0	5.8	41.0	1.2	1.7	13.28	19.60	2.34
01/06/2010	11h 55m 54.74s	+03° 05' 14.6"	9.520658	9.168248	76.25	107.4	18.1	16.1	1.0	5.8	40.9	1.2	1.7	13.24	19.56	2.30
02/06/2010	11h 55m 55.04s	+03° 04' 58.5"	9.520960	9.184143	76.38	106.4	18.0	16.1	1.0	5.9	40.9	1.2	1.7	13.20	19.52	2.26
03/06/2010	11h 55m 55.72s	+03° 04' 40.0"	9.521262	9.200117	76.52	105.5	18.0	16.1	1.0	5.9	40.8	1.2	1.7	13.16	19.48	2.22
04/06/2010	11h 55m 56.77s	+03° 04' 18.9"	9.521564	9.216166	76.65	104.5	18.0	16.0	1.0	5.9	40.7	1.2	1.7	13.12	19.44	2.18
05/06/2010	11h 55m 58.19s	+03° 03' 55.5"	9.521866	9.232286	76.78	103.6	17.9	16.0	1.0	5.9	40.7	1.2	1.7	13.08	19.40	2.14
06/06/2010	11h 55m 59.98s	+03° 03' 29.6"	9.522168	9.248471	76.92	102.6	17.9	16.0	1.0	6.0	40.6	1.2	1.7	13.04	19.36	2.10
07/06/2010	11h 56m 02.14s	+03° 03' 01.2"	9.522470	9.264718	77.05	101.7	17.9	15.9	1.0	6.0	40.5	1.2	1.7	13.00	19.32	2.06
08/06/2010	11h 56m 04.69s	+03° 02' 30.4"	9.522772	9.281022	77.19	100.8	17.8	15.9	1.0	6.0	40.4	1.2	1.7	12.96	19.28	2.02
09/06/2010	11h 56m 07.60s	+03° 01' 57.1"	9.523074	9.297379	77.32	99.8	17.8	15.9	1.0	6.0	40.4	1.2	1.8	12.92	19.24	2.00
10/06/2010	11h 56m 10.89s	+03° 01' 21.4"	9.523376	9.313783	77.46	98.9	17.8	15.9	1.0	6.0	40.3	1.2	1.8	12.88	19.20	1.96
11/06/2010	11h 56m 14.56s	+03° 00' 43.3"	9.523678	9.330230	77.60	97.9	17.7	15.8	1.0	6.1	40.2	1.2	1.8	12.84	19.16	1.92
12/06/2010	11h 56m 18.61s	+03° 00'														

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq.°	Diam. Pol.°	Mag.	Phase angle°	Max °	Min °	B °	Rise	Trans.	Set.
22/07/2010	12h 03m 41.67s	+02° 03' 21.9"	9.536055	9.988081	83.07	60.9	16.6	14.8	1.1	5.3	37.6	1.9	2.9	9.03	15.28	21.53
23/07/2010	12h 03m 59.06s	+02° 01' 18.1"	9.536356	10.002539	83.19	60.1	16.5	14.8	1.1	5.3	37.5	1.9	2.9	8.59	15.25	21.50
24/07/2010	12h 04m 16.70s	+01° 59' 12.6"	9.536658	10.016871	83.31	59.2	16.5	14.7	1.1	5.2	37.5	1.9	2.9	8.56	15.21	21.46
25/07/2010	12h 04m 34.61s	+01° 57' 05.7"	9.536960	10.031073	83.43	58.3	16.5	14.7	1.1	5.2	37.4	1.9	3.0	8.52	15.17	21.42
26/07/2010	12h 04m 52.77s	+01° 54' 57.2"	9.537262	10.045143	83.54	57.5	16.5	14.7	1.1	5.2	37.4	2.0	3.0	8.49	15.14	21.39
27/07/2010	12h 05m 11.18s	+01° 52' 47.2"	9.537563	10.059078	83.66	56.6	16.5	14.7	1.1	5.1	37.3	2.0	3.1	8.46	15.10	21.35
28/07/2010	12h 05m 29.84s	+01° 50' 35.8"	9.537865	10.072875	83.77	55.7	16.4	14.7	1.1	5.0	37.3	2.0	3.1	8.42	15.07	21.31
29/07/2010	12h 05m 48.74s	+01° 48' 22.9"	9.538167	10.086532	83.89	54.8	16.4	14.6	1.1	5.0	37.2	2.0	3.2	8.39	15.03	21.27
30/07/2010	12h 06m 07.89s	+01° 46' 08.6"	9.538469	10.100045	84.00	54.0	16.4	14.6	1.1	4.9	37.2	2.1	3.2	8.35	15.00	21.24
31/07/2010	12h 06m 27.28s	+01° 43' 52.9"	9.538770	10.113411	84.11	53.1	16.4	14.6	1.1	4.9	37.1	2.1	3.2	8.32	14.56	21.20
01/08/2010	12h 06m 46.90s	+01° 41' 35.8"	9.539072	10.126628	84.22	52.3	16.3	14.6	1.1	4.8	37.1	2.1	3.3	8.29	14.52	21.16
02/08/2010	12h 07m 06.76s	+01° 39' 17.3"	9.539374	10.139693	84.33	51.4	16.3	14.6	1.1	4.8	37.0	2.1	3.3	8.25	14.49	21.13
03/08/2010	12h 07m 26.86s	+01° 36' 57.4"	9.539675	10.152603	84.44	50.5	16.3	14.5	1.1	4.7	37.0	2.2	3.4	8.22	14.45	21.09
04/08/2010	12h 07m 47.18s	+01° 34' 36.2"	9.539977	10.165355	84.54	49.7	16.3	14.5	1.1	4.6	36.9	2.2	3.4	8.18	14.42	21.05
05/08/2010	12h 08m 07.74s	+01° 32' 13.7"	9.540279	10.177945	84.65	48.8	16.3	14.5	1.1	4.6	36.9	2.2	3.5	8.15	14.38	21.01
06/08/2010	12h 08m 28.52s	+01° 29' 49.9"	9.540580	10.190372	84.75	47.9	16.2	14.5	1.1	4.5	36.8	2.3	3.5	8.12	14.35	20.58
07/08/2010	12h 08m 49.52s	+01° 27' 24.8"	9.540882	10.202632	84.85	47.1	16.2	14.5	1.1	4.5	36.8	2.3	3.6	8.08	14.31	20.54
08/08/2010	12h 09m 10.73s	+01° 24' 58.4"	9.541184	10.214722	84.95	46.2	16.2	14.5	1.1	4.4	36.7	2.3	3.6	8.05	14.28	20.50
09/08/2010	12h 09m 32.16s	+01° 22' 30.9"	9.541485	10.226358	85.05	45.4	16.2	14.4	1.1	4.3	36.7	2.3	3.6	8.02	14.24	20.47
10/08/2010	12h 09m 53.79s	+01° 20' 02.2"	9.541787	10.238379	85.15	44.5	16.2	14.4	1.1	4.3	36.7	2.4	3.7	7.58	14.21	20.43
11/08/2010	12h 10m 15.61s	+01° 17' 32.4"	9.542089	10.249941	85.25	43.6	16.1	14.4	1.1	4.2	36.6	2.4	3.7	7.55	14.17	20.39
12/08/2010	12h 10m 37.64s	+01° 15' 01.6"	9.542390	10.261320	85.34	42.8	16.1	14.4	1.1	4.1	36.6	2.4	3.8	7.52	14.14	20.36
13/08/2010	12h 10m 59.86s	+01° 12' 29.6"	9.542692	10.272516	85.43	41.9	16.1	14.4	1.1	4.1	36.5	2.4	3.8	7.48	14.10	20.32
14/08/2010	12h 11m 22.27s	+01° 09' 56.5"	9.542993	10.283525	85.53	41.1	16.1	14.4	1.1	4.0	36.5	2.5	3.9	7.45	14.07	20.28
15/08/2010	12h 11m 44.88s	+01° 07' 22.5"	9.543295	10.294344	85.62	40.2	16.1	14.3	1.1	3.9	36.5	2.5	3.9	7.41	14.03	20.25
16/08/2010	12h 12m 07.67s	+01° 04' 47.4"	9.543597	10.304973	85.70	39.4	16.1	14.3	1.1	3.9	36.4	2.5	4.0	7.38	14.00	20.21
17/08/2010	12h 12m 30.64s	+01° 02' 11.2"	9.543898	10.315408	85.79	38.5	16.0	14.3	1.1	3.8	36.4	2.6	4.0	7.35	13.56	20.17
18/08/2010	12h 12m 53.79s	+00° 59' 34.2"	9.544200	10.325648	85.88	37.7	16.0	14.3	1.1	3.7	36.4	2.6	4.1	7.31	13.53	20.14
19/08/2010	12h 13m 17.11s	+00° 56' 56.2"	9.544501	10.335691	85.96	36.8	16.0	14.3	1.1	3.6	36.3	2.6	4.1	7.28	13.49	20.10
20/08/2010	12h 13m 40.60s	+00° 54' 17.3"	9.544803	10.345535	86.04	35.9	16.0	14.3	1.1	3.6	36.3	2.7	4.2	7.25	13.46	20.06
21/08/2010	12h 14m 04.26s	+00° 51' 37.5"	9.545104	10.355179	86.12	35.1	16.0	14.3	1.1	3.5	36.2	2.7	4.2	7.21	13.42	20.03
22/08/2010	12h 14m 28.07s	+00° 48' 56.9"	9.545406	10.364621	86.20	34.2	16.0	14.2	1.0	3.4	36.2	2.7	4.3	7.18	13.39	19.59
23/08/2010	12h 14m 52.04s	+00° 46' 15.5"	9.545708	10.373858	86.28	33.4	16.0	14.2	1.0	3.3	36.2	2.7	4.3	7.15	13.35	19.55
24/08/2010	12h 15m 16.16s	+00° 43' 33.3"	9.546009	10.382889	86.35	32.5	15.9	14.2	1.0	3.3	36.2	2.8	4.4	7.11	13.32	19.52
25/08/2010	12h 15m 40.43s	+00° 40' 50.3"	9.546311	10.391713	86.43	31.7	15.9	14.2	1.0	3.2	36.1	2.8	4.4	7.08	13.28	19.48
26/08/2010	12h 16m 04.84s	+00° 38' 06.5"	9.546612	10.400328	86.50	30.8	15.9	14.2	1.0	3.1	36.1	2.8	4.5	7.05	13.25	19.44
27/08/2010	12h 16m 29.39s	+00° 35' 22.1"	9.546914	10.408732	86.57	30.0	15.9	14.2	1.0	3.0	36.1	2.9	4.6	7.02	13.21	19.41
28/08/2010	12h 16m 54.09s	+00° 32' 37.0"	9.547215	10.416923	86.63	29.1	15.9	14.2	1.0	3.0	36.0	2.9	4.6	6.58	13.18	19.37
29/08/2010	12h 17m 18.93s	+00° 29' 51.1"	9.547517	10.424899	86.70	28.3	15.9	14.2	1.0	2.9	36.0	2.9	4.7	6.55	13.14	19.33
30/08/2010	12h 17m 43.90s	+00° 27' 04.6"	9.547818	10.432660	86.77	27.4	15.9	14.2	1.0	2.8	36.0	3.0	4.7	6.52	13.11	19.30
31/08/2010	12h 18m 09.00s	+00° 24' 17.4"	9.548120	10.440202	86.83	26.6	15.9	14.1	1.0	2.7	36.0	3.0	4.8	6.48	13.07	19.26
01/09/2010	12h 18m 34.23s	+00° 21' 29.6"	9.548421	10.447524	86.89	25.7	15.8	14.1	1.0	2.6	35.9	3.0	4.8	6.45	13.04	19.22
02/09/2010	12h 18m 59.59s	+00° 18' 41.1"	9.548722	10.454625	86.95	24.9	15.8	14.1	1.0	2.5	35.9	3.0	4.9	6.42	13.00	19.19
03/09/2010	12h 19m 25.07s	+00° 15' 52.1"	9.549024	10.461502	87.01	24.0	15.8	14.1	1.0	2.5	35.9	3.1	4.9	6.38	12.57	19.15
04/09/2010	12h 19m 50.67s	+00° 13' 02.6"	9.549325	10.468153	87.06	23.2	15.8	14.1	1.0	2.4	35.9	3.1	5.0	6.35	12.53	19.11
05/09/2010	12h 20m 16.38s	+00° 10' 12.5"	9.549627	10.474578	87.11	22.3	15.8	14.1	1.0	2.3	35.8	3.1	5.0	6.32	12.50	19.08
06/09/2010	12h 20m 42.20s	+00° 07' 22.0"	9.549928	10.480773	87.17	21.5	15.8	14.1	1.0	2.2	35.8	3.2	5.1	6.28	12.46	19.04
07/09/2010	12h 21m 08.11s	+00° 04' 31.1"	9.550230	10.486737	87.22	20.6	15.8	14.1	1.0	2.1	35.8	3.2	5.1	6.25	12.43	19.00
08/09/2010	12h 21m 34.13s	+00° 01' 39.7"	9.550531	10.492469	87.26	19.8	15.8	14.1	1.0	2.0	35.8	3.2	5.2	6.22	12.39	18.57
09/09/2010	12h 22m 00.24s	-00° 01' 12.0"	9.550832	10.497966	87.31	18.9	15.8	14.1	1.0	2.0	35.8	3.3	5.3	6.19	12.36	18.53
10/09/2010	12h 22m 26.44s	-00° 04' 04.1"	9.551134	10.503228	87.35	18.1	15.8	14.1	1.0	1.9	35.7	3.3	5.3	6.15	12.32	18.49
11/09/2010	12h 22m 52.73s	-00° 06' 56.6"	9.551435	10.508253	87.39	17.3	15.8	14.1	1.0	1.8	35.7	3.3	5.4	6.12	12.29	18.46
12/09/2010	12h 23m 19.11s	-00° 09' 49.4"	9.551737	10.513041	87.43	16.4	15.7	14.0	1.0	1.7	35.7	3.4	5.4	6.09	12.25	18.42
13/09/2010	12h 23m 45.57s	-00° 12' 42.5"	9.552038	10.517590	87.47	15.6	15.7	14.0	1.0	1.6	35.7	3.4	5.5	6.05	12.22	18.38
14/09/2010	12h 24m 12.11s	-00° 15' 35.8"	9.552339	10.521899	87.51	14.7	15.7	14.0	0.9	1.5	35.7	3.4	5.5	6.02	12.18	18.35
15/09/2010	12h 24m 38.72s	-00° 18' 29.4"	9.552641	10.525968	87.54	13.9	15.7	14.0	0.9	1.4	35.7	3.5	5.6	5.59	12.15	18.31
16/09/2010	12h 25m 05.40s	-00° 21' 23.2"	9.552942	10.529797	87.57	13.0	15.7	14.0	0.9	1.4	35.6	3.5	5.6	5.55	12.12	18.27
17/09/2010	12h 25m 32.14s	-00° 24' 17.1"	9.553243	10.533384	87.60	12.2	15.7	14.0	0.9	1.3	35.6	3.5	5.7	5.52	12.08	18.24
18/09/2010	12h 25m 58.94s	-00° 27' 11.2"	9.553545	10.536729	87.63	11.4	15.7	14.0	0.9	1.2	35.6	3.6	5.7	5.49	12.05	18.20
19/09/2010	12h 26m 25.80s	-00° 30' 05.4"	9.553846	10.539832	87.66	10.5	15.7	14.0	0.9	1.1	35.6	3.6	5.8	5.46	12.01	18.17
20/09/2010	12h 26m 52.70s	-00° 32' 59.7"	9.554147	10.542692	87.68	9.7	15.7	14.0	0.9	1.0	35.6	3.6	5.9	5.42	11.58	18.13
21/09/2010	12h 27m 19.65s	-00° 35' 54.0"	9.554448	10.545309	87.70	8.9	15.7	14.0	0.9	0.9	35.6	3.7	5.9	5.39	11.54	18.09
22/09/2010	12h 27m 46.64s	-00° 38' 48.4"	9.554750	10.547682	87.72	8.0	15.7	14.0	0.9	0.8	35.6	3.7	6.0	5.36	11.51	18.06
23/09/2010	12h 28m 13.68s	-00° 41' 42.8"	9.555051	10.549810	87.74	7.2	15.7	14.0	0.9	0.8	35.6	3.7	6.0	5.32	11.47	18.02
24/09/2010	12h 28m 40.75s	-00° 44														

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. Eq.*	Diam. Pol.*	Mag.	Phase angle°	Max "	Min "	B °	Rise	Trans.	Set.
03/11/2010	12h 46m 29.78s	-02° 35' 50.2"	9.567393	10.424599	86.70	28.8	15.9	14.2	0.9	2.9	36.0	5.1	8.2	3.15	9.24	15.32
04/11/2010	12h 46m 54.97s	-02° 38' 21.6"	9.567694	10.416507	86.63	29.7	15.9	14.2	0.9	2.9	36.0	5.2	8.2	3.12	9.20	15.28
05/11/2010	12h 47m 20.03s	-02° 40' 52.0"	9.567995	10.408189	86.56	30.6	15.9	14.2	0.9	3.0	36.1	5.2	8.3	3.09	9.17	15.24
06/11/2010	12h 47m 44.95s	-02° 43' 21.3"	9.568295	10.399647	86.49	31.5	15.9	14.2	0.9	3.1	36.1	5.2	8.3	3.05	9.13	15.21
07/11/2010	12h 48m 09.73s	-02° 45' 49.3"	9.568596	10.390883	86.42	32.4	15.9	14.2	0.9	3.2	36.1	5.3	8.4	3.02	9.09	15.17
08/11/2010	12h 48m 34.37s	-02° 48' 16.2"	9.568897	10.381898	86.34	33.3	15.9	14.2	0.9	3.3	36.2	5.3	8.4	2.58	9.06	15.13
09/11/2010	12h 48m 58.86s	-02° 50' 41.9"	9.569197	10.372695	86.27	34.2	16.0	14.2	0.9	3.3	36.2	5.3	8.5	2.55	9.02	15.10
10/11/2010	12h 49m 23.19s	-02° 53' 06.2"	9.569498	10.363277	86.19	35.1	16.0	14.3	0.9	3.4	36.2	5.4	8.5	2.51	8.59	15.06
11/11/2010	12h 49m 47.35s	-02° 55' 29.3"	9.569799	10.353646	86.11	36.0	16.0	14.3	0.9	3.5	36.3	5.4	8.6	2.48	8.55	15.02
12/11/2010	12h 50m 11.35s	-02° 57' 51.1"	9.570099	10.343803	86.03	36.9	16.0	14.3	0.9	3.6	36.3	5.4	8.6	2.45	8.52	14.59
13/11/2010	12h 50m 35.17s	-03° 00' 11.5"	9.570400	10.333753	85.94	37.8	16.0	14.3	0.9	3.6	36.3	5.5	8.7	2.41	8.48	14.55
14/11/2010	12h 50m 58.82s	-03° 02' 30.5"	9.570701	10.323496	85.86	38.6	16.0	14.3	0.9	3.7	36.4	5.5	8.7	2.38	8.44	14.51
15/11/2010	12h 51m 22.29s	-03° 04' 48.1"	9.571001	10.313036	85.77	39.6	16.0	14.3	0.9	3.8	36.4	5.5	8.7	2.34	8.41	14.47
16/11/2010	12h 51m 45.57s	-03° 07' 04.3"	9.571302	10.302375	85.68	40.5	16.1	14.3	0.9	3.8	36.4	5.6	8.8	2.31	8.37	14.44
17/11/2010	12h 52m 08.66s	-03° 09' 19.1"	9.571602	10.291515	85.59	41.4	16.1	14.4	0.9	3.9	36.5	5.6	8.8	2.27	8.34	14.40
18/11/2010	12h 52m 31.56s	-03° 11' 32.4"	9.571903	10.280460	85.50	42.3	16.1	14.4	0.9	4.0	36.5	5.6	8.9	2.24	8.30	14.36
19/11/2010	12h 52m 54.27s	-03° 13' 44.2"	9.572203	10.269211	85.41	43.2	16.1	14.4	0.9	4.1	36.6	5.7	8.9	2.20	8.26	14.33
20/11/2010	12h 53m 16.78s	-03° 15' 54.5"	9.572504	10.257771	85.31	44.1	16.1	14.4	0.9	4.1	36.6	5.7	9.0	2.17	8.23	14.29
21/11/2010	12h 53m 39.10s	-03° 18' 03.3"	9.572804	10.246143	85.21	45.0	16.2	14.4	0.9	4.2	36.6	5.7	9.0	2.13	8.19	14.25
22/11/2010	12h 54m 01.20s	-03° 20' 10.6"	9.573105	10.234329	85.12	45.9	16.2	14.4	0.9	4.2	36.7	5.8	9.0	2.10	8.16	14.21
23/11/2010	12h 54m 23.10s	-03° 22' 16.3"	9.573405	10.222332	85.02	46.8	16.2	14.4	0.9	4.3	36.7	5.8	9.1	2.06	8.12	14.18
24/11/2010	12h 54m 44.79s	-03° 24' 20.5"	9.573706	10.210154	84.91	47.7	16.2	14.5	0.9	4.4	36.8	5.8	9.1	2.03	8.08	14.14
25/11/2010	12h 55m 06.25s	-03° 26' 23.0"	9.574006	10.197797	84.81	48.6	16.2	14.5	0.9	4.4	36.8	5.9	9.2	1.59	8.05	14.10
26/11/2010	12h 55m 27.50s	-03° 28' 23.9"	9.574306	10.185265	84.71	49.5	16.3	14.5	0.8	4.5	36.9	5.9	9.2	1.56	8.01	14.07
27/11/2010	12h 55m 48.51s	-03° 30' 23.1"	9.574607	10.172559	84.60	50.5	16.3	14.5	0.8	4.6	36.9	5.9	9.2	1.52	7.58	14.03
28/11/2010	12h 56m 09.28s	-03° 32' 20.5"	9.574907	10.159682	84.50	51.4	16.3	14.5	0.8	4.6	36.9	5.9	9.3	1.49	7.54	13.59
29/11/2010	12h 56m 29.82s	-03° 34' 16.3"	9.575208	10.146637	84.39	52.3	16.3	14.6	0.8	4.7	37.0	6.0	9.3	1.45	7.50	13.55
30/11/2010	12h 56m 50.11s	-03° 36' 10.2"	9.575508	10.133428	84.28	53.2	16.3	14.6	0.8	4.7	37.0	6.0	9.3	1.42	7.47	13.52
01/12/2010	12h 57m 10.16s	-03° 38' 02.4"	9.575808	10.120055	84.17	54.1	16.4	14.6	0.8	4.8	37.1	6.0	9.4	1.38	7.43	13.48
02/12/2010	12h 57m 29.96s	-03° 39' 52.8"	9.576109	10.106524	84.05	55.1	16.4	14.6	0.8	4.8	37.1	6.1	9.4	1.34	7.39	13.44
03/12/2010	12h 57m 49.50s	-03° 41' 41.4"	9.576409	10.092837	83.94	56.0	16.4	14.6	0.8	4.9	37.2	6.1	9.4	1.31	7.36	13.40
04/12/2010	12h 58m 08.79s	-03° 43' 28.1"	9.576709	10.078998	83.82	56.9	16.4	14.7	0.8	4.9	37.2	6.1	9.5	1.27	7.32	13.37
05/12/2010	12h 58m 27.82s	-03° 45' 13.0"	9.577009	10.065009	83.71	57.9	16.4	14.7	0.8	5.0	37.3	6.2	9.5	1.24	7.28	13.33
06/12/2010	12h 58m 46.58s	-03° 46' 56.0"	9.577310	10.050876	83.59	58.8	16.5	14.7	0.8	5.0	37.3	6.2	9.5	1.20	7.25	13.29
07/12/2010	12h 59m 05.06s	-03° 48' 37.0"	9.577610	10.036602	83.47	59.7	16.5	14.7	0.8	5.1	37.4	6.2	9.6	1.16	7.21	13.25
08/12/2010	12h 59m 23.27s	-03° 50' 16.2"	9.577910	10.022190	83.35	60.7	16.5	14.7	0.8	5.1	37.5	6.2	9.6	1.13	7.17	13.21
09/12/2010	12h 59m 41.19s	-03° 51' 53.3"	9.578210	10.007645	83.23	61.6	16.5	14.8	0.8	5.2	37.5	6.3	9.6	1.09	7.13	13.18
10/12/2010	12h 59m 58.83s	-03° 53' 28.5"	9.578510	9.992971	83.11	62.5	16.6	14.8	0.8	5.2	37.6	6.3	9.7	1.06	7.10	13.14
11/12/2010	13h 00m 16.17s	-03° 55' 01.6"	9.578810	9.978171	82.99	63.5	16.6	14.8	0.8	5.3	37.6	6.3	9.7	1.02	7.06	13.10
12/12/2010	13h 00m 33.21s	-03° 56' 32.7"	9.579111	9.963250	82.86	64.4	16.6	14.8	0.8	5.3	37.7	6.4	9.7	0.58	7.02	13.06
13/12/2010	13h 00m 49.96s	-03° 58' 01.7"	9.579411	9.948212	82.74	65.3	16.6	14.8	0.8	5.4	37.7	6.4	9.8	0.55	6.59	13.03
14/12/2010	13h 01m 06.40s	-03° 59' 28.6"	9.579711	9.933061	82.61	66.3	16.7	14.9	0.8	5.4	37.8	6.4	9.8	0.51	6.55	12.59
15/12/2010	13h 01m 22.54s	-04° 00' 53.5"	9.580011	9.917801	82.48	67.2	16.7	14.9	0.8	5.4	37.8	6.4	9.8	0.47	6.51	12.55
16/12/2010	13h 01m 38.37s	-04° 02' 16.3"	9.580311	9.902436	82.36	68.2	16.7	14.9	0.8	5.5	37.9	6.5	9.8	0.44	6.47	12.51
17/12/2010	13h 01m 53.89s	-04° 03' 37.0"	9.580611	9.886971	82.23	69.1	16.7	14.9	0.8	5.5	38.0	6.5	9.9	0.40	6.44	12.47
18/12/2010	13h 02m 09.10s	-04° 04' 55.5"	9.580911	9.871408	82.10	70.1	16.8	15.0	0.8	5.5	38.0	6.5	9.9	0.36	6.40	12.44
19/12/2010	13h 02m 24.00s	-04° 06' 12.0"	9.581211	9.855752	81.97	71.0	16.8	15.0	0.8	5.6	38.1	6.6	9.9	0.33	6.36	12.40
20/12/2010	13h 02m 38.57s	-04° 07' 26.3"	9.581511	9.840008	81.84	72.0	16.8	15.0	0.8	5.6	38.1	6.6	9.9	0.29	6.32	12.36
21/12/2010	13h 02m 52.82s	-04° 08' 38.4"	9.581811	9.824178	81.70	72.9	16.8	15.0	0.8	5.6	38.2	6.6	10.0	0.25	6.29	12.32
22/12/2010	13h 03m 06.74s	-04° 09' 48.3"	9.582111	9.808268	81.57	73.9	16.9	15.1	0.8	5.7	38.3	6.6	10.0	0.21	6.25	12.28
23/12/2010	13h 03m 20.34s	-04° 10' 56.1"	9.582410	9.792281	81.44	74.9	16.9	15.1	0.8	5.7	38.3	6.7	10.0	0.18	6.21	12.24
24/12/2010	13h 03m 33.59s	-04° 12' 01.6"	9.582710	9.776221	81.31	75.8	16.9	15.1	0.8	5.7	38.4	6.7	10.0	0.14	6.17	12.21
25/12/2010	13h 03m 46.50s	-04° 13' 04.8"	9.583010	9.760091	81.17	76.8	17.0	15.1	0.8	5.7	38.5	6.7	10.0	0.10	6.13	12.17
26/12/2010	13h 03m 59.06s	-04° 14' 05.8"	9.583310	9.743897	81.04	77.7	17.0	15.2	0.8	5.8	38.5	6.7	10.1	0.06	6.10	12.13
27/12/2010	13h 04m 11.28s	-04° 15' 04.4"	9.583610	9.727642	80.90	78.7	17.0	15.2	0.8	5.8	38.6	6.8	10.1	0.03	6.06	12.09
28/12/2010	13h 04m 23.15s	-04° 16' 00.7"	9.583910	9.711330	80.77	79.7	17.0	15.2	0.8	5.8	38.7	6.8	10.1	23.55	6.02	12.05
29/12/2010	13h 04m 34.67s	-04° 16' 54.8"	9.584209	9.694966	80.63	80.6	17.1	15.2	0.8	5.8	38.7	6.8	10.1	23.51	5.58	12.01
30/12/2010	13h 04m 45.83s	-04° 17' 46.5"	9.584509	9.678554	80.49	81.6	17.1	15.3	0.8	5.8	38.8	6.8	10.1	23.47	5.54	11.58
31/12/2010	13h 04m 56.64s	-04° 18' 35.9"	9.584809	9.662100	80.36	82.6	17.1	15.3	0.8	5.8	38.8	6.8	10.1	23.44	5.51	11.54

A.R., Dec. = coordinate apparenti  
R. = distanza dal Sole in U.A.  
Distance = distanza dalla Terra in U.A.  
Light = distanza in minuti-luce  
El. = elongazione dal Sole in °  
Diam. = diametro equatoriale e polare in "  
Mag. = magnitudine  
Max = diametro dell'asse maggiore degli anelli in "  
Min = diametro dell'asse minore degli anelli in "  
B = latitudine saturnocentrica della Terra, in °

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

A.R., Dec. = apparent coordinates  
R. = distance from the Sun in A.U.  
Distance = distance from the Earth in A.U.  
Light = distance in minutes  
El. = elongation from the Sun in °  
Diam. = equatorial and polar diameter in "  
Mag. = magnitude  
Max = diameter of the major axis of the rings in "  
Min = diameter of the minor axis of the rings in "  
B = Saturnocentric latitude of the Earth, in °

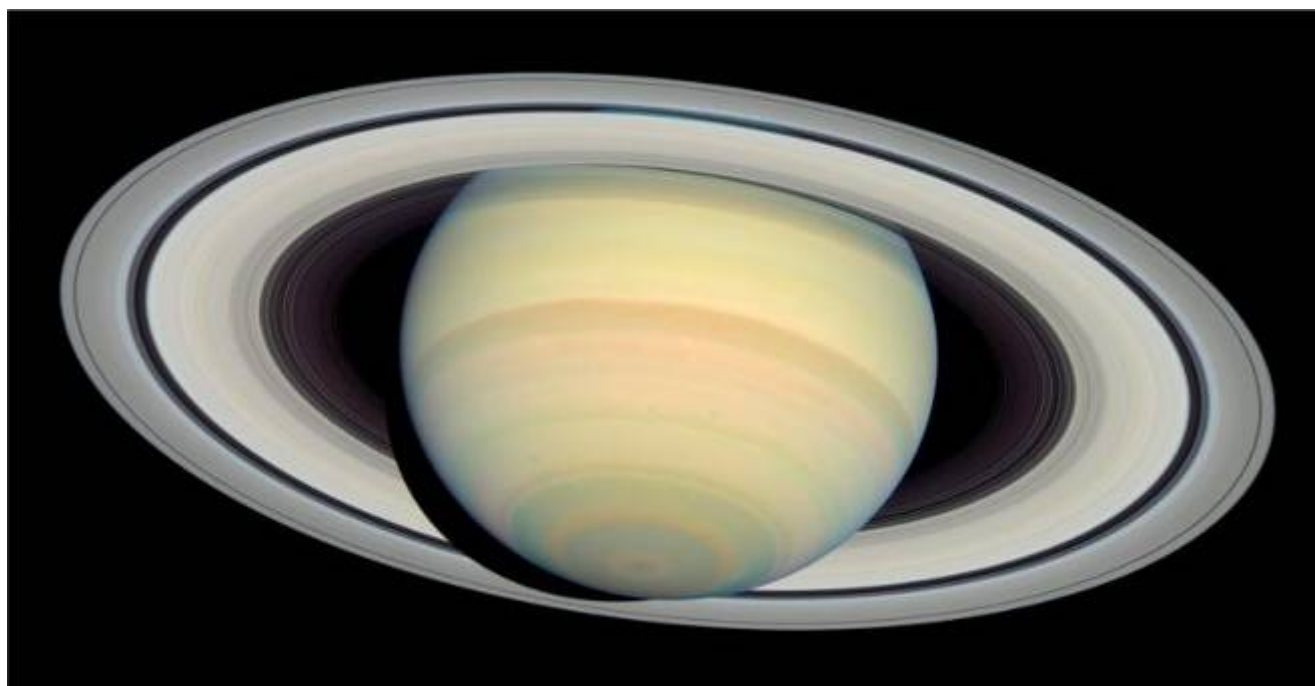
Times of rising and setting of the planet for Rome (42°N, 12°E), in U.T.+1



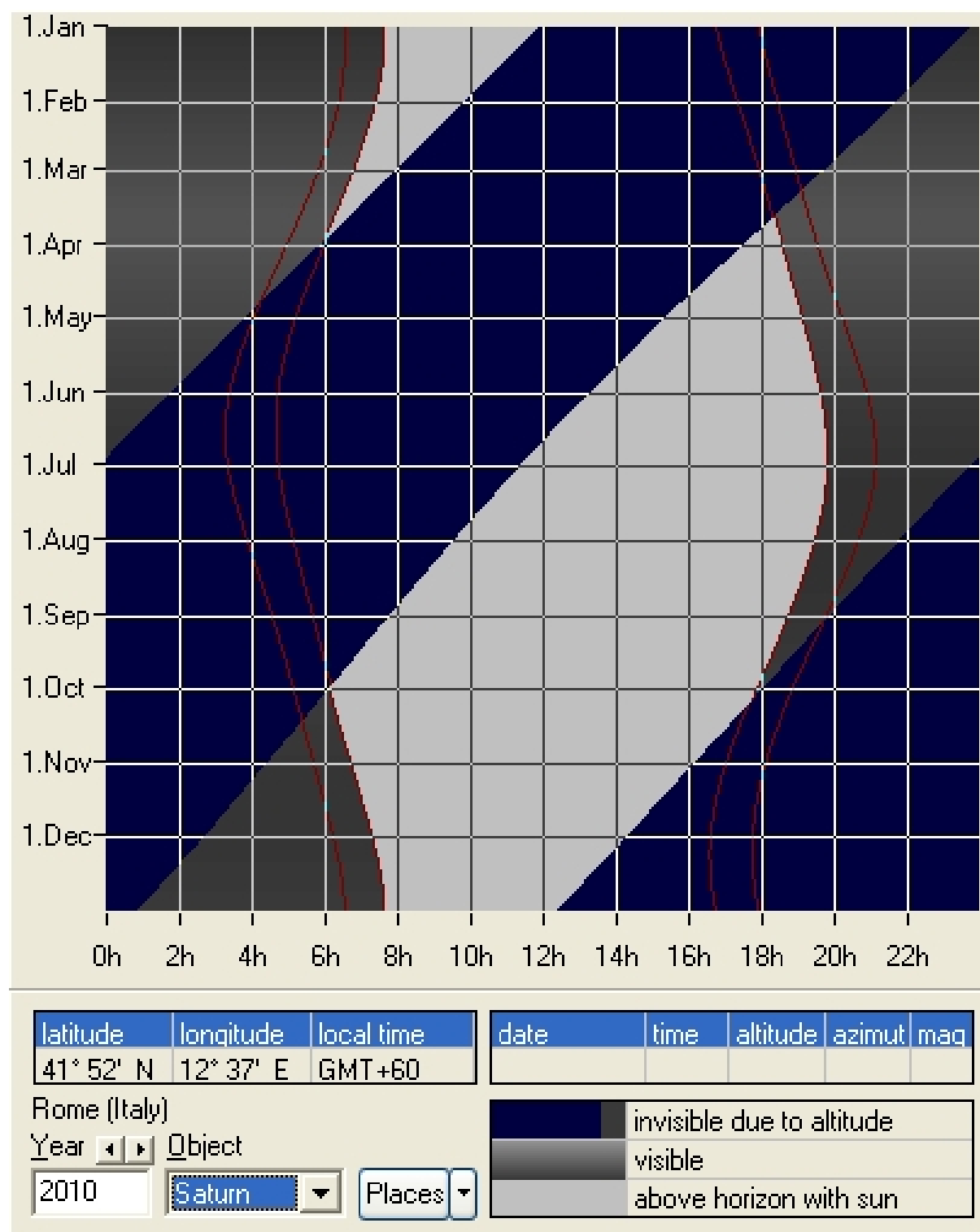
# FENOMENI DI SATURNO - PHENOMENA OF SATURN

Perielio - Perihelion	Questo anno non avviene - No phenomenon			
Afelio - Aphelion	Questo anno non avviene - No phenomenon			
Perigeo - Perigee	21/03/2010	22.15.39	8.50382 AU	
Apogeo - Apogee	01/10/2010	02.53.31	10.55798 AU	
Magnit. Max - Brightness maximum	22/03/2010	16.27.55	0.5	mag
Magnit. Max - Brightness maximum	03/10/2010	01.47.21	0.9	mag
Magnit. Min - Brightness minimum	20/07/2010	01.40.34	1.1	mag
Magnit. Min - Brightness minimum	30/10/2010	01.14.09	0.9	mag
Opposizione - Opposition	22/03/2010	00.37.20		
Congiunzione - Conjunction	01/10/2010	00.42.03		
Moto retrogr. - Retrograde motion	14/01/2010	18.49.43		
Moto diretto - Prograde motion	31/05/2010	16.18.27		
Max ang. Fase - Maximum phase angle	19/06/2010	17.58.56	6.1	°
Min ang. Fase - Minimum phase angle	22/03/2010	02.34.13	0.3	°
Min ang. Fase - Minimum phase angle	01/10/2010	01.32.44	0.2	°
Estr. lat. Terra- Extremum lat. Earth	08/01/2010	10.59.35	4.90	°

© (5)



# VISIBILITA' DI SATURNO - VISIBILITY OF SATURN



Visibilità di Saturno nel corso dell'anno - Visibility of Saturn during the year

Le righe rosse più esterne indicano in quali periodi dell'anno il pianeta è sufficientemente distante dal Sole per poter essere osservato agevolmente. Le date esatte sono riportate nelle tabelle seguenti.

The external red lines show in what periods of the year the planet is sufficiently distant from the Sun to be able to be observed easily. The exact dates are in the following tables.

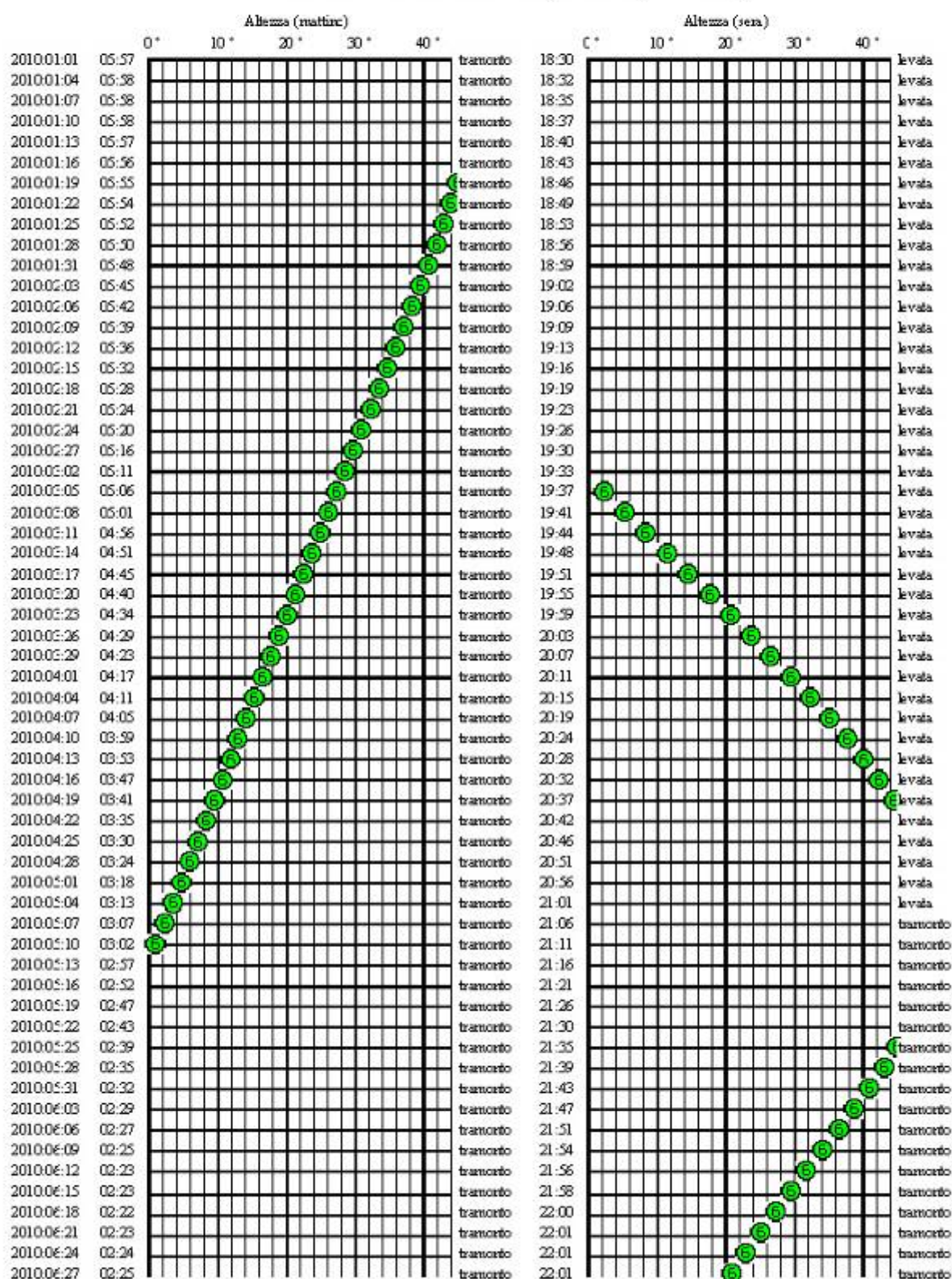


# Altezza ai crepuscoli

## di Saturno

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)

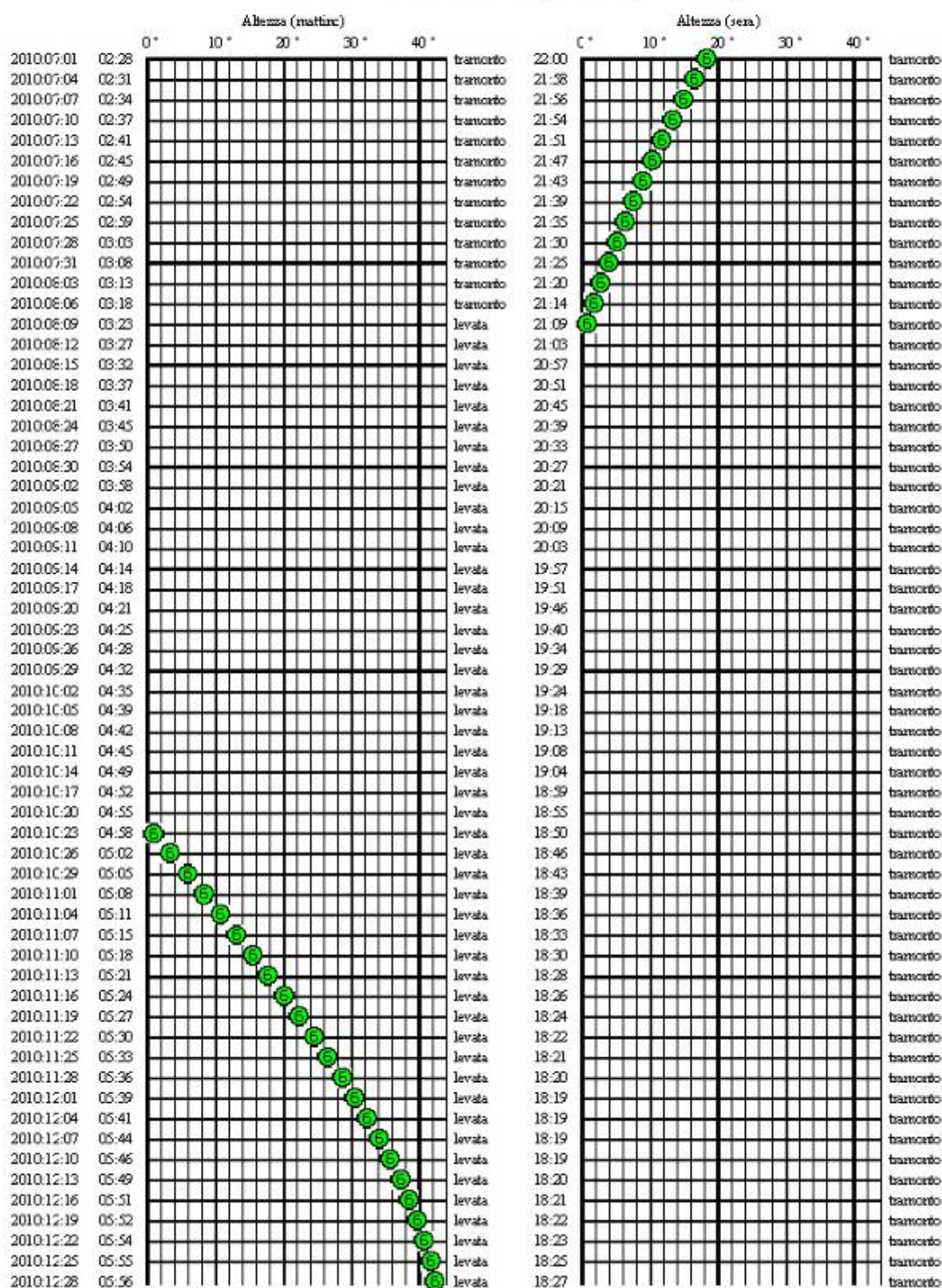


# Altezza ai crepuscoli

## di Saturno

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)





Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:01:01	05:57	48.4	183.8	96.2	18:30	-46.6	16.3	96.7
2010:01:04	05:58	48.1	188.3	99.2	18:32	-45.8	21.2	99.7
2010:01:07	05:58	47.7	192.7	102.2	18:35	-44.7	26.1	102.7
2010:01:10	05:58	47.2	196.9	105.2	18:37	-43.5	30.8	105.7
2010:01:13	05:57	46.5	200.9	108.2	18:40	-42.0	35.3	108.8
2010:01:16	05:56	45.7	204.7	111.3	18:43	-40.3	39.7	111.8
2010:01:19	05:55	44.9	208.3	114.4	18:46	-38.4	43.8	114.9
2010:01:22	05:54	43.9	211.7	117.5	18:49	-36.4	47.8	118.0
2010:01:25	05:52	42.9	215.0	120.6	18:53	-34.2	51.7	121.1
2010:01:28	05:50	41.8	218.0	123.7	18:56	-31.8	55.3	124.2
2010:01:31	05:48	40.7	220.9	126.8	18:59	-29.4	58.8	127.4
2010:02:03	05:45	39.5	223.7	129.9	19:02	-26.8	62.1	130.5
2010:02:06	05:42	38.3	226.3	133.1	19:06	-24.2	65.3	133.7
2010:02:09	05:39	37.1	228.7	136.2	19:09	-21.5	68.3	136.8
2010:02:12	05:36	35.9	231.1	139.4	19:13	-18.6	71.3	140.0
2010:02:15	05:32	34.7	233.3	142.6	19:16	-15.8	74.1	143.2
2010:02:18	05:28	33.5	235.4	145.8	19:19	-12.9	76.9	146.4
2010:02:21	05:24	32.2	237.4	149.0	19:23	-9.9	79.6	149.6
2010:02:24	05:20	31.0	239.4	152.2	19:26	-6.9	82.3	152.8
2010:02:27	05:16	29.7	241.2	155.4	19:30	-3.9	85.0	156.0
2010:03:02	05:11	28.5	243.0	158.5	19:33	-0.8	87.6	159.2
2010:03:05	05:06	27.3	244.7	161.7	19:37	2.2	90.2	162.4
2010:03:08	05:01	26.1	246.3	164.9	19:41	5.3	92.9	165.6
2010:03:11	04:56	24.8	247.9	168.1	19:44	8.4	95.5	168.7
2010:03:14	04:51	23.6	249.4	171.2	19:48	11.5	98.2	171.8
2010:03:17	04:45	22.4	250.9	174.2	19:51	14.5	101.0	174.8
2010:03:20	04:40	21.2	252.3	176.8	19:55	17.6	103.9	177.1
2010:03:23	04:34	20.0	253.7	177.2	19:59	20.6	106.9	176.8
2010:03:26	04:29	18.8	255.1	174.9	20:03	23.6	109.9	174.3
2010:03:29	04:23	17.7	256.4	172.0	20:07	26.6	113.2	171.3
2010:04:01	04:17	16.5	257.7	168.9	20:11	29.5	116.6	168.2
2010:04:04	04:11	15.3	259.0	165.8	20:15	32.3	120.2	165.1
2010:04:07	04:05	14.1	260.2	162.7	20:19	35.0	124.1	161.9
2010:04:10	03:59	13.0	261.5	159.5	20:24	37.6	128.2	158.8
2010:04:13	03:53	11.8	262.7	156.4	20:28	40.1	132.7	155.7
2010:04:16	03:47	10.6	263.9	153.3	20:32	42.4	137.4	152.6
2010:04:19	03:41	9.5	265.0	150.2	20:37	44.5	142.6	149.4
2010:04:22	03:35	8.3	266.2	147.1	20:42	46.4	148.0	146.3
2010:04:25	03:30	7.1	267.4	144.0	20:46	48.0	153.9	143.3
2010:04:28	03:24	5.9	268.5	140.9	20:51	49.3	160.1	140.2
2010:05:01	03:18	4.7	269.7	137.9	20:56	50.3	166.7	137.1
2010:05:04	03:13	3.5	270.8	134.8	21:01	50.9	173.4	134.1
2010:05:07	03:07	2.2	272.0	131.8	21:06	51.1	180.2	131.1
2010:05:10	03:02	1.0	273.2	128.8	21:11	50.9	187.1	128.1
2010:05:13	02:57	-0.3	274.4	125.8	21:16	50.4	193.8	125.1
2010:05:16	02:52	-1.7	275.6	122.9	21:21	49.5	200.2	122.1
2010:05:19	02:47	-3.0	276.9	119.9	21:26	48.2	206.4	119.2
2010:05:22	02:43	-4.4	278.2	117.0	21:30	46.7	212.2	116.2
2010:05:25	02:39	-5.9	279.5	114.1	21:35	45.0	217.5	113.3
2010:05:28	02:35	-7.4	280.9	111.2	21:39	43.0	222.5	110.4
2010:05:31	02:32	-9.0	282.4	108.3	21:43	40.9	227.0	107.5
2010:06:03	02:29	-10.6	283.9	105.4	21:47	38.7	231.2	104.7
2010:06:06	02:27	-12.3	285.6	102.6	21:51	36.4	235.0	101.8
2010:06:09	02:25	-14.0	287.3	99.8	21:54	34.1	238.5	99.0
2010:06:12	02:23	-15.9	289.2	97.0	21:56	31.8	241.7	96.2
2010:06:15	02:23	-17.8	291.2	94.2	21:58	29.5	244.7	93.4
2010:06:18	02:22	-19.8	293.3	91.4	22:00	27.3	247.3	90.6
2010:06:21	02:23	-21.8	295.6	88.6	22:01	25.1	249.8	87.9
2010:06:24	02:24	-23.9	298.0	85.9	22:01	23.0	252.0	85.1
2010:06:27	02:25	-26.1	300.7	83.1	22:01	20.9	254.1	82.4
2010:06:30	02:27	-28.2	303.5	80.4	22:00	19.0	256.0	79.7

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:07:01	02:28	-28.9	304.5	79.5	22:00	18.4	256.6	78.8
2010:07:04	02:31	-31.1	307.7	76.8	21:58	16.6	258.2	76.1
2010:07:07	02:34	-33.2	311.1	74.1	21:56	14.8	259.8	73.4
2010:07:10	02:37	-35.3	314.8	71.5	21:54	13.2	261.2	70.7
2010:07:13	02:41	-37.3	318.7	68.8	21:51	11.7	262.5	68.1
2010:07:16	02:45	-39.1	322.9	66.1	21:47	10.2	263.8	65.4
2010:07:19	02:49	-40.8	327.4	63.5	21:43	8.8	264.9	62.8
2010:07:22	02:54	-42.4	332.1	60.9	21:39	7.5	266.0	60.2
2010:07:25	02:59	-43.7	337.1	58.3	21:35	6.2	267.0	57.6
2010:07:28	03:03	-44.9	342.3	55.6	21:30	5.0	267.9	55.0
2010:07:31	03:08	-45.7	347.8	53.0	21:25	3.9	268.8	52.4
2010:08:03	03:13	-46.3	353.4	50.4	21:20	2.7	269.7	49.8
2010:08:06	03:18	-46.6	359.0	47.9	21:14	1.7	270.5	47.2
2010:08:09	03:23	-46.6	4.7	45.3	21:09	0.6	271.3	44.6
2010:08:12	03:27	-46.4	10.3	42.7	21:03	-0.4	272.0	42.1
2010:08:15	03:32	-45.9	15.8	40.1	20:57	-1.4	272.7	39.5
2010:08:18	03:37	-45.1	21.1	37.6	20:51	-2.4	273.4	36.9
2010:08:21	03:41	-44.1	26.3	35.0	20:45	-3.4	274.1	34.4
2010:08:24	03:45	-42.9	31.2	32.4	20:39	-4.3	274.8	31.8
2010:08:27	03:50	-41.5	35.9	29.9	20:33	-5.2	275.5	29.3
2010:08:30	03:54	-39.9	40.3	27.3	20:27	-6.2	276.1	26.7
2010:09:02	03:58	-38.1	44.5	24.8	20:21	-7.1	276.8	24.2
2010:09:05	04:02	-36.3	48.5	22.2	20:15	-8.0	277.4	21.7
2010:09:08	04:06	-34.3	52.2	19.7	20:09	-9.0	278.1	19.1
2010:09:11	04:10	-32.3	55.7	17.2	20:03	-9.9	278.8	16.6
2010:09:14	04:14	-30.1	59.1	14.6	19:57	-10.8	279.5	14.1
2010:09:17	04:18	-27.9	62.3	12.1	19:51	-11.8	280.2	11.5
2010:09:20	04:21	-25.7	65.4	9.6	19:46	-12.7	280.9	9.0
2010:09:23	04:25	-23.4	68.3	7.1	19:40	-13.7	281.6	6.6
2010:09:26	04:28	-21.1	71.1	4.7	19:34	-14.7	282.3	4.2
2010:09:29	04:32	-18.7	73.8	2.7	19:29	-15.7	283.1	2.4
2010:10:02	04:35	-16.3	76.5	2.4	19:24	-16.7	283.9	2.6
2010:10:05	04:39	-13.9	79.0	4.2	19:18	-17.7	284.8	4.6
2010:10:08	04:42	-11.4	81.5	6.5	19:13	-18.8	285.6	7.0
2010:10:11	04:45	-9.0	84.0	9.0	19:08	-19.9	286.5	9.5
2010:10:14	04:49	-6.5	86.4	11.5	19:04	-21.0	287.5	12.1
2010:10:17	04:52	-4.0	88.9	14.1	18:59	-22.2	288.5	14.6
2010:10:20	04:55	-1.6	91.3	16.7	18:55	-23.3	289.6	17.2
2010:10:23	04:58	0.9	93.7	19.3	18:50	-24.5	290.7	19.8
2010:10:26	05:02	3.4	96.1	21.9	18:46	-25.7	291.9	22.4
2010:10:29	05:05	5.8	98.5	24.6	18:43	-27.0	293.2	25.1
2010:11:01	05:08	8.3	100.9	27.2	18:39	-28.3	294.5	27.7
2010:11:04	05:11	10.7	103.4	29.9	18:36	-29.6	296.0	30.4
2010:11:07	05:15	13.1	106.0	32.5	18:33	-31.0	297.5	33.0
2010:11:10	05:18	15.4	108.5	35.2	18:30	-32.4	299.2	35.7
2010:11:13	05:21	17.8	111.2	37.9	18:28	-33.8	300.9	38.4
2010:11:16	05:24	20.1	113.9	40.6	18:26	-35.2	302.8	41.1
2010:11:19	05:27	22.3	116.7	43.3	18:24	-36.6	304.9	43.8
2010:11:22	05:30	24.5	119.6	46.1	18:22	-38.1	307.1	46.6
2010:11:25	05:33	26.6	122.6	48.8	18:21	-39.6	309.5	49.3
2010:11:28	05:36	28.6	125.7	51.6	18:20	-41.0	312.1	52.1
2010:12:01	05:39	30.6	128.9	54.3	18:19	-42.5	314.9	54.8
2010:12:04	05:41	32.4	132.2	57.1	18:19	-43.9	317.9	57.6
2010:12:07	05:44	34.1	135.7	59.9	18:19	-45.3	321.2	60.4
2010:12:10	05:46	35.7	139.2	62.7	18:19	-46.6	324.7	63.2
2010:12:13	05:49	37.2	142.9	65.5	18:20	-47.9	328.5	66.0
2010:12:16	05:51	38.5	146.6	68.4	18:21	-49.0	332.7	68.9
2010:12:19	05:52	39.7	150.5	71.2	18:22	-50.1	337.1	71.7
2010:12:22	05:54	40.8	154.4	74.1	18:23	-50.9	341.8	74.6
2010:12:25	05:55	41.6	158.4	77.0	18:25	-51.6	346.8	77.5
2010:12:28	05:56	42.4	162.4	79.9	18:27	-52.1	352.1	80.4
2010:12:31	05:57	42.9	166.4	82.8	18:29	-52.4	357.5	83.3

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

heliacal dates for Saturn in 2010  
location : Rome (Italy)  
latitude : 41° 52' 12'' N  
longitude: 12° 37' 12'' E  
variable arcus visionis:  
arcvis [°] = 10.5 + 1.4 \* magnitude  
critical altitude: 0.00°

date eliache per Saturno  
posizione : Roma  
latitudine : 41° 52' 12'' N  
longitudine: 12° 37' 12'' E  
visibilità minima [°] = 10.5 + 1.4 \* magnitudine  
altezza critica : 0.00°

	date	obj r/s	sun r/s	d r/s	age	mag
last visibility	2010-09-02	19:45	18:41	1:03h	-28d 06h	1.2
first visibility	2010-10-15	05:17	06:21	-1:03h	14d 04h	1.1

Date : data nel formato mese/giorno  
Obj r/s : ora del tramonto o della levata del pianeta  
Sun r/s: ora del tramonto o della levata del Sole  
D r/s : differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due oggetti  
Age : giorni trascorsi dalla congiunzione col Sole  
Mag : magnitudine  
Morning visibility begins : inizio visibilità mattutina  
Morning visibility ends : fine visibilità mattutina  
Evening visibility begins : inizio visibilità serale  
Evening visibility ends : fine visibilità serale  
Last visibility : ultimo giorno di visibilità  
Firs visibilità : primo giorno di visibilità

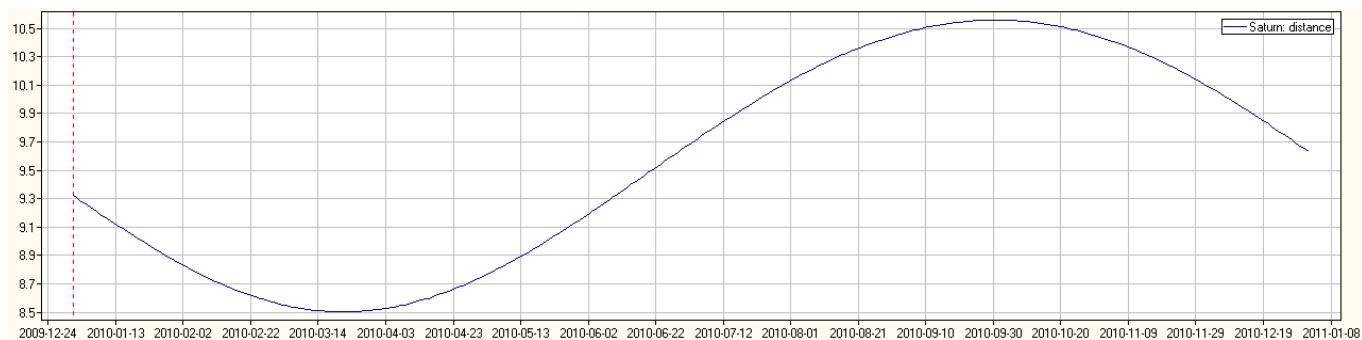
Obj r/s : rising and setting of the planet  
Sun r/s : sunrise and sunset  
D r/s : difference in hours and minutes between the instants of the rising or the setting of the two objects  
Age : days from the conjunction with the Sun  
Mag : magnitude

	date	obj r/s	sun r/s	sun alt	sun lon	obj lon	obj lat	mag	d az	d lon
L	09-02	19:45	18:41	-12° 11'	160° 12'	184° 20'	2° 10'	1.2	-21° 25'	24° 08'
F	10-15	05:17	06:21	-12° 43'	201° 43'	189° 29'	2° 11'	1.1	1° 56'	-12° 14'

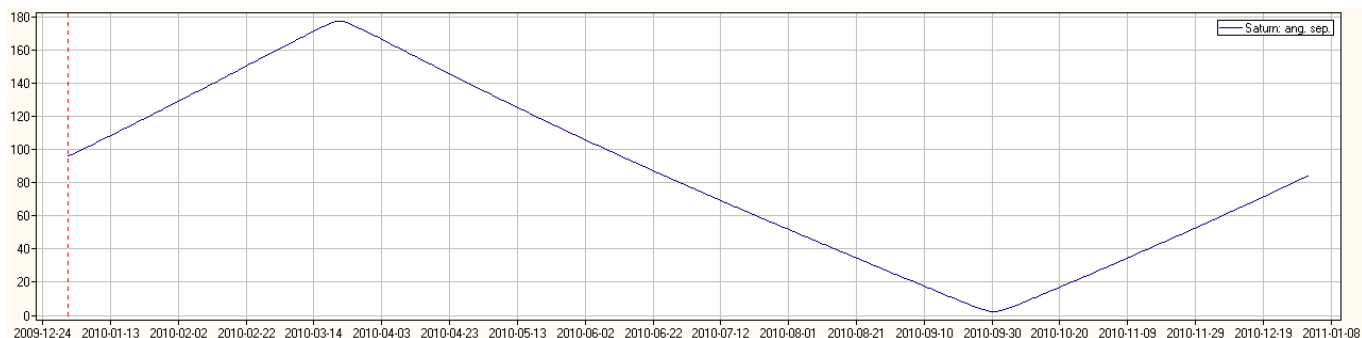
Date : data nel formato mese/giorno  
Sun alt : altezza del Sole nell'istante di visibilità del pianeta  
Sun lon : longitudine celeste del Sole  
Obj lon : longitudine celeste del pianeta  
Obj lat : latitudine celeste del pianeta  
Mag : magnitudine  
D az : differenza in azimut tra i centri del Sole e del pianeta nell'istante della sua visibilità  
D lon : differenza in longitudine tra i centri del Sole e del pianeta nell'istante della sua visibilità  
L = ultimo giorno di visibilità  
F = primo giorno di visibilità

Date : date in the format month/day  
Sun alt : altitude of the Sun in the instant of visibility of the planet  
Sun lon : celestial longitude of the Sun  
Obj lon : celestial longitude of the planet  
Obj lat : Celestial latitude of the planet  
Mag : magnitude  
D az : difference in azimuth between the centers of the Sun and the planet in the instant of its visibility  
D lon : difference in longitude between the centers of the Sun and the planet in the instant of its visibility

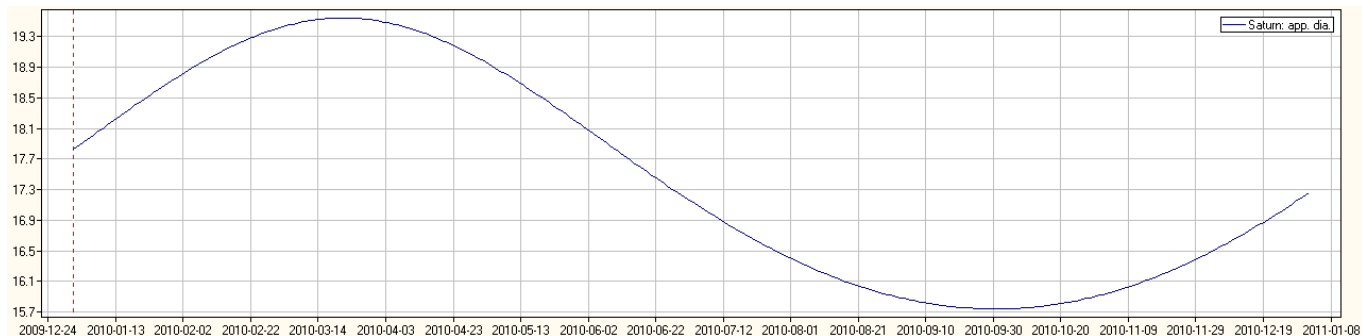
© (3)



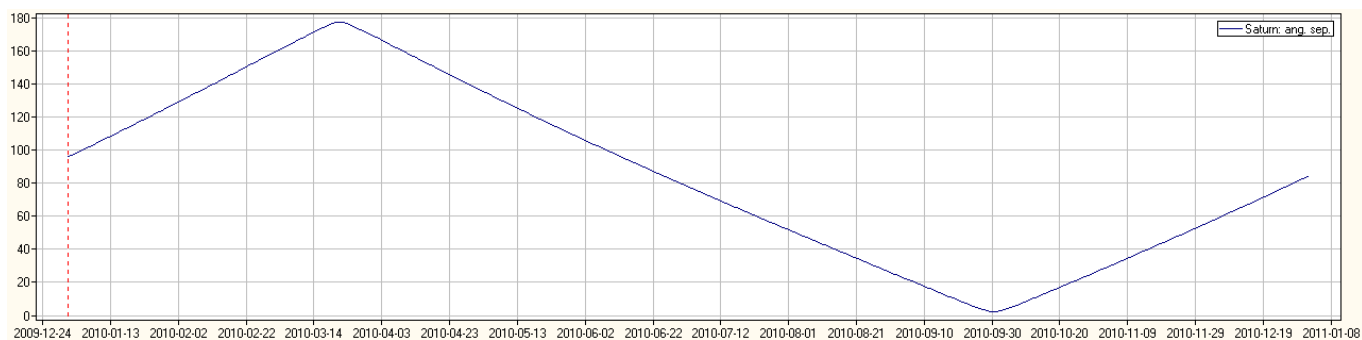
Distanza di Saturno in U.A. nel corso dell'anno - Distance of Saturn in A.U. during the year



Elongazione di Saturno in ° nel corso dell'anno - Elongation of Saturn in ° during the year



Diametro di Saturno in " nel corso dell'anno - Diameter of Saturn in " during the year



Magnitudine di Saturno nel corso dell'anno - Magnitude of Saturn during the year

# COORDINATE DEI SATELLITI DI SATURNO

## COORDINATES OF THE SATELLITES OF SATURN

	Tethys: x y z			Dione: x y z			Rhea: x y z			Titan: x y z		
01/01/2010	-3.6632	0.2373	3.2163	4.9988	0.3205	3.7567	0.2574	-0.7441	-8.6834	8.9087	1.6046	18.7375
02/01/2010	4.1989	-0.1594	-2.4843	-6.1113	0.1080	1.2427	8.6296	-0.1101	-1.2949	1.4711	1.7688	20.6431
03/01/2010	-4.5869	0.0757	1.6660	3.1617	-0.4621	-5.3724	2.8382	0.7064	8.2284	-6.1724	1.6830	19.6305
04/01/2010	4.8169	0.0106	-0.7896	1.9876	0.5073	5.9119	-7.6031	0.3658	4.2678	-12.9267	1.3546	15.7952
05/01/2010	-4.8787	-0.0966	-0.1144	-5.7320	-0.2090	-2.4465	-5.5670	-0.5758	-6.6877	-17.7705	0.8255	9.6292
06/01/2010	4.7708	0.1792	1.0145	5.6679	-0.2288	-2.6436	5.6238	-0.5710	-6.6433	-19.9013	0.1697	1.9987
07/01/2010	-4.4977	-0.2555	-1.8795	-1.7236	0.5154	5.9858	7.5738	0.3729	4.3247	-18.8892	-0.5134	-5.9411
08/01/2010	4.0668	0.3228	2.6792	-3.3123	-0.4525	-5.2664	-2.8963	0.7057	8.2069	-14.8039	-1.1133	-12.9097
09/01/2010	-3.4958	-0.3788	-3.3857	6.1776	0.0861	1.0182	-8.6156	-0.1184	-1.3641	-8.2594	-1.5282	-17.7338
10/01/2010	2.8014	0.4213	3.9745	-4.8263	0.3405	3.9437	-0.1786	-0.7476	-8.6850	-0.3306	-1.6874	-19.5938
11/01/2010	-2.0107	-0.4491	-4.4250	0.2877	-0.5348	-6.2142	8.5543	-0.1470	-1.7200	7.6569	-1.5659	-18.2017
12/01/2010	1.1489	0.4609	4.7214	4.5135	0.3705	4.3231	3.2419	0.6947	8.0787	14.4018	-1.1894	-13.8463
13/01/2010	-0.2472	-0.4567	-4.8533	-6.2165	0.0445	0.5011	-7.3836	0.3973	4.6350	18.8728	-0.6251	-7.2983
14/01/2010	-0.6627	0.4362	4.8160	3.7876	-0.4265	-4.9562	-5.8891	-0.5509	-6.4083	20.4607	0.0342	0.3718
15/01/2010	1.5509	-0.4007	-4.6109	1.2597	0.5232	6.1061	5.2923	-0.5920	-6.9082	19.0220	0.6873	7.9934
16/01/2010	-2.3832	0.3509	4.2448	-5.3921	-0.2661	-3.1210	7.7747	0.3395	3.9548	14.8440	1.2400	14.4681
17/01/2010	3.1348	-0.2892	-3.7306	5.9477	-0.1676	-1.9426	-2.4971	0.7125	8.3367	8.5658	1.6157	18.8959
18/01/2010	-3.7747	0.2173	3.0861	-2.4393	0.4900	5.7321	-8.6715	-0.0822	-0.9513	1.0836	1.7630	20.6628
19/01/2010	4.2852	-0.1381	-2.3338	-2.6426	-0.4796	-5.6310	-0.5946	-0.7393	-8.6671	-6.5501	1.6602	19.5001
20/01/2010	-4.6442	0.0544	1.4999	6.0076	0.1482	1.7591	8.4627	-0.1797	-2.1221	-13.2369	1.3185	15.5235
21/01/2010	4.8423	0.0309	-0.6134	-5.2739	0.2836	3.3244	3.6198	0.6726	7.9183	-17.9596	0.7829	9.2473
22/01/2010	-4.8708	-0.1148	-0.2947	1.0515	-0.5202	-6.1341	-7.1576	0.4207	4.9755	-19.9290	0.1298	1.5591
23/01/2010	4.7288	0.1941	1.1926	3.9478	0.4083	4.8416	-6.1834	-0.5189	-6.1281	-18.7386	-0.5407	-6.3701
24/01/2010	-4.4224	-0.2662	-2.0490	-6.2306	-0.0211	-0.2683	4.9642	-0.6022	-7.1463	-14.4884	-1.1198	-13.2549
25/01/2010	3.9600	0.3284	2.8340	4.3732	-0.3757	-4.4547	7.9493	0.3030	3.5936	-7.8242	-1.5098	-17.9317
26/01/2010	-3.3606	-0.3789	-3.5199	0.4933	0.5208	6.2142	-2.1109	0.7074	8.4434	0.1545	-1.6451	-19.6050
27/01/2010	2.6420	0.4153	4.0828	-4.9605	-0.3137	-3.7663	-8.7063	-0.0474	-0.5555	8.1114	-1.5065	-18.0198
28/01/2010	-1.8322	-0.4372	-4.5030	6.1443	-0.1009	-1.1933	-0.9901	-0.7197	-8.6325	14.7507	-1.1236	-13.4984
29/01/2010	0.9573	0.4431	4.7656	-3.1364	0.4478	5.3842	8.3576	-0.2068	-2.5015	19.0599	-0.5658	-6.8378
30/01/2010	-0.0489	-0.4337	-4.8615	-1.9143	-0.4894	-5.9184	3.9728	0.6414	7.7497	20.4562	0.0747	0.8753
31/01/2010	-0.8606	0.4085	4.7870	5.7405	0.2041	2.4925	-6.9274	0.4353	5.2906	18.8250	0.6996	8.4657
01/02/2010	1.7415	-0.3695	-4.5449	-5.6506	0.2179	2.6375	-6.4515	-0.4811	-5.8487	14.4802	1.2193	14.8400
02/02/2010	-2.5595	0.3173	4.1436	1.8182	-0.4877	-5.9564	4.6412	-0.6016	-7.3598	8.0835	1.5623	19.1115
03/02/2010	3.2903	-0.2546	-3.5969	3.3061	0.4306	5.2981	8.1001	0.2649	3.2421	0.5483	1.6828	20.6856
04/02/2010	-3.9034	0.1832	2.9240	-6.1460	-0.0839	-1.0527	-1.7383	0.6910	8.5295	-7.0627	1.5639	19.3185
05/02/2010	4.3819	-0.1060	-2.1485	4.9039	-0.3136	-3.8704	-8.7225	-0.0152	-0.1765	-13.6493	1.2205	15.1540
06/02/2010	-4.7050	0.0257	1.2975	-0.2996	0.5001	6.2269	-1.3658	-0.6898	-8.5836	-18.2028	0.6993	8.7364
07/02/2010	4.8643	0.0548	-0.4008	-4.4386	-0.3481	-4.3670	8.2412	-0.2276	-2.8594	-19.9547	0.0761	0.9799
08/02/2010	-4.8526	-0.1325	-0.5101	6.2471	-0.0339	-0.4069	4.3025	0.6026	7.5746	-18.5305	-0.5530	-6.9264
09/02/2010	4.6702	0.2047	1.4033	-3.7991	0.3918	4.9418	-6.6945	0.4407	5.5824	-14.0703	-1.0853	-13.6938
10/02/2010	-4.3249	-0.2690	-2.2474	-1.1380	-0.4811	-6.1170	-6.6958	-0.4391	-5.5712	-7.2593	-1.4316	-18.1743
11/02/2010	3.8262	0.3229	3.0127	5.3745	0.2493	3.2031	4.3239	-0.5904	-7.5511	0.7738	-1.5348	-19.6049
12/02/2010	-3.1949	-0.3649	-3.6724	-5.9431	0.1486	1.8918	8.2297	0.2264	8.9022	8.6820	-1.3824	-17.7734
13/02/2010	2.4497	0.3932	4.2032	2.5720	-0.4397	-5.6774	-1.3787	0.6643	8.5972	15.1788	-1.0073	-13.0439
14/02/2010	-1.6196	-0.4074	-4.5865	2.5963	0.4357	5.6786	-8.7225	0.0134	0.1866	19.2773	-0.4779	-6.2464
15/02/2010	0.7319	0.4066	4.8086	-5.9576	-0.1389	-1.8370	-1.7231	-0.6512	-8.5221	20.4294	0.1178	1.5137
16/02/2010	0.1817	-0.3917	-4.8619	5.3647	-0.2449	-3.2098	8.1154	-0.2417	-3.1975	18.5571	0.6888	9.0567
17/02/2010	-1.0881	0.3626	4.7442	-1.1039	0.4627	6.1371	4.6108	0.5576	7.3942	14.0080	1.1535	15.2975
18/02/2010	1.9579	-0.3212	-4.4598	-3.8316	-0.3665	-4.9074	-6.4598	0.4373	5.8531	7.4714	1.4491	19.3676
19/02/2010	-2.7569	0.2686	4.0185	6.2479	0.0284	0.4026	-6.9187	-0.3945	-5.2959	-0.1192	1.5369	20.6987
20/02/2010	3.4614	-0.2073	-3.4358	-4.4109	0.3263	4.4076	4.0121	-0.5697	-7.7226	-7.6906	1.4058	19.0792
21/02/2010	-4.0417	0.1393	2.7322	-0.3276	-0.4556	-6.2164	8.3403	0.1890	2.5670	-14.1431	1.0737	14.6887
22/02/2010	4.4822	-0.0673	-1.9323	4.9112	0.2805	3.8738	-1.0311	0.6285	8.6487	-18.4818	0.5872	8.1071
23/02/2010	-4.7633	-0.0062	1.0643	-6.1396	0.0809	1.1001	-8.7081	0.0377	0.5357	-19.9657	0.0179	0.2793
24/02/2010	4.8778	0.0783	-0.1588	3.2954	-0.3802	-5.2969	-2.0641	-0.6055	-8.4495	-18.2611	-0.5454	-7.5868
25/02/2010	-4.8206	-0.1467	-0.7525	1.8302	0.4235	5.9697	7.9810	-0.2491	-3.5183	-13.5559	-1.0109	-14.2023
26/02/2010	4.5931	0.2087	1.6374	-5.6635	-0.1821	-2.6035	4.9007	0.5083	7.2088	-6.5808	-1.3010	-18.4409
27/02/2010	-4.2052	-0.2624	-2.4648	5.7412	-0.1749	-2.4829	-6.2232	0.4258	6.1053	1.5039	-1.3692	-19.5807
28/02/2010	3.6676	0.3057	3.2056	-1.9019	0.4120	5.9406	-7.1229	-0.3488	-5.0216	9.3419	-1.2096	-17.4603
01/03/2010	-3.0027	-0.3375	-3.8336	-3.1489	-0.3684	-5.3716	3.7044	-0.5408	-7.8765	15.6607	-0.8568	-12.4926
02/03/2010	2.2304	0.3565	4.3268	6.1411	0.0815	1.2178	8.4344	0.1535	2.2405	19.5058	-0.3754	-5.5444
03/03/2010	-1.3807	-0.3626	-4.6676	-4.9547	0.2569	3.7891	-0.6928	0.5858	8.6854	20.3708	0.1547	2.2586
04/03/2010	0.4819	0.3552	4.8441	0.4996	-0.4155	-6.2090	-8.6808	0.0575	0.8735	18.2208	0.6526	9.7344
05/03/2010	0.4342	-0.3355	-4.8501	4.3568	0.2962	4.4869	-2.3919	-0.5548	-8.3662	13.4422	1.0481	15.8096
06/03/2010	-1.3339	0.3038	4.6852	-6.2311	0.0198	0.2785	7.8384	-0.2502	-3.8250	6.7554	1.2884	19.6396
07/03/2010	2.1885	-0.2619	-4.3553	3.9700	-0.3143	-4.8188	5.1752	0.4566	7.0176	-0.8855	1.3433	20.6882
08/03/2010	-2.9638	0.2111	3.8719	1.0234	0.3963	6.1604	-5.9835	0.4075	6.3421	-8.3976	1.2070	18.7819
09/03/2010	3.6372	-0.1537	-3.2521	-5.2662	-0.2113	-3.3330	-7.3114	-0.3034	-4.7466	-14.6851	0.8991	14.1415
10/03/2010	-4.1800	0.0917	2.5176	6.0209	-0.1090	-1.7042	3.3985	-0.5056	-8.0152	-18.7716	0.4638	7.3863
11/03/2010	4.5778	-0.0275	-1.6944	-2.6742	0.3528	5.6376	8.5138	0.1207	1.9180	-19.9503	-0.0339	-0.5068
12/03/2010	-4.8128	-0.0364	0.8114	-2.4039	-0.3548	-5.7453	-0.3609	0.5381	8.7087	-17.9344	-0.5160	-8.3121
13/03/2010	4.8790	0.0979	0.1003	5.9255	0.1221	2.0196	-8.6414	0.0727	1.2033	-12.9651	-0.9041	-14.7447
14/03/2010	-4.7734	-0.1547	-1.0085	-5.4152	0.1888	3.0979	-2.7098	-0.5012	-8.2722	-5.8216	-1.1339	-18.7061
15/03/2010	4.4988	0.2048	1.8813	1.3244	-0.3653	-6.0913	7.6869	-0.2460	-4.1206	2.3044	-1.1698	-19.5220
16/03/2010	-4.0672	-0.2465	-2.6879	3.7218	0.2968	5.0258	5.4375	0.4044	6.8193	10.0500	-1.0119	-17.0876
17/03/2010	3.4906	0.2784	3.3998	-6.2121	-0.0310	-0.5541	-5.7390	0.3839	6.5660	16.1619	-0.6939	-11.8685
18/03/2010	-2.7929	-0.2998	-3.9921	4.5781	-0.2475	-4.2519	-7.4865	-0.2598	-4.4685	19.7235	-0.2742	-4.7696
19/03/2010	1.9952	0.3096	4.4437	0.1942	0.3576	6.2430	3.0918	-0.4662	-8.1405	20.2752	0.1778	3.0649
20/03/2010	-1.1283	-0.3083	-4.7388	-4.7729	-0.2259	-4.0071	8.5801	0.0914	1.5963	17.8291	0.5937	10.4529
21/03/2010	0.2214	0.2955	4.8670	6.1952	-0.0514	-0.8913	-0.0320	0.4880				



	Tethys: x			y	z	Dione: x			y	z	Rhea: x			y	z	Titan: x			y	z	
14/04/2010	4.7288	0.0360	-1.2101	0.0242	-0.2589	-6.2354	-7.9519	-0.1496	-3.5833	-11.6924	-0.6564	-15.7750									
15/04/2010	-4.8706	-0.0789	0.3077	4.6829	0.1691	4.1532	2.1313	-0.3461	-8.4481	-4.2500	-0.7856	-19.1442									
16/04/2010	4.8417	0.1180	0.6055	-6.1926	0.0321	0.7565	8.7066	0.0252	0.5993	3.9089	-0.7811	-19.2981									
17/04/2010	-4.6434	-0.1520	-1.4974	3.5879	-0.2052	-5.1121	0.9745	0.3464	8.6715	11.4214	-0.6484	-16.2475									
18/04/2010	4.2811	0.1797	2.3367	1.4910	0.2393	6.0742	-8.3556	0.0983	2.5134	17.0837	-0.4150	-10.5593									
19/04/2010	-3.7703	-0.2003	-3.0940	-5.5103	-0.1124	-2.9176	-3.9523	-0.3032	-7.7667	20.0622	-0.1227	-3.2058									
20/04/2010	3.1255	0.2130	3.7427	5.8700	-0.0847	-2.1634	6.9594	-0.2017	-5.2568	19.9336	0.1808	4.6417									
21/04/2010	-2.3728	-0.2179	-4.2600	-2.2288	0.2225	5.8373	6.4229	0.2253	5.9086	16.9820	0.4508	11.8114									
22/04/2010	1.5358	0.2145	4.6281	-2.8498	-0.2077	-5.5438	-4.6569	0.2767	7.3794	11.5310	0.6502	17.2864									
23/04/2010	-0.6457	-0.2035	-4.8338	6.0643	0.0563	1.5548	-8.0904	-0.1219	-3.2603	4.4478	0.7538	20.3111									
24/04/2010	-0.2667	0.1851	4.8702	-5.1538	0.1305	3.5223	1.7863	-0.3129	-8.5288	-3.2621	0.7496	20.4610									
25/04/2010	1.1707	-0.1605	-4.7359	0.8328	-0.2245	-6.1821	8.7236	0.0098	0.2451	-10.5035	0.6397	17.6858									
26/04/2010	-2.0319	0.1304	4.4358	4.1091	0.1683	4.7215	1.3273	0.3093	8.6259	-16.2097	0.4401	12.3305									
27/04/2010	2.8240	-0.0962	-3.9804	-6.2379	-0.0003	-0.0492	-8.2456	0.1003	2.8542	-19.4779	0.1796	5.1267									
28/04/2010	-3.5147	0.0591	3.3857	4.2171	-0.1628	-4.6105	-4.2699	-0.2670	-7.5984	-19.7178	-0.1027	-2.8667									
29/04/2010	4.0848	-0.0206	-2.6726	0.7003	0.2154	6.2152	6.7353	-0.1915	-5.5409	-16.7905	-0.3625	-10.3927									
30/04/2010	-4.5098	-0.0180	1.8660	-5.0890	-0.1225	-3.6018	6.6627	0.1942	5.6376	-11.0939	-0.5576	-16.2006									
01/05/2010	4.7786	0.0553	-0.9943	6.0993	-0.0489	-1.3974	-4.3451	0.2565	7.5683	-3.5381	-0.6563	-19.2950									
02/05/2010	-4.8794	-0.0899	0.0879	-2.9550	0.1858	5.5050	-8.2204	-0.0990	-2.9185	4.6135	-0.6440	-19.1541									
03/05/2010	4.8097	0.1207	0.8215	-2.1174	-0.1948	-5.8637	1.4241	-0.2862	-8.5975	12.0032	-0.5264	-15.8403									
04/05/2010	-4.5726	-0.1465	-1.7021	5.8184	0.0748	2.3111	8.7260	-0.0031	-0.1242	17.4539	-0.3267	-9.9627									
05/05/2010	4.1745	0.1667	2.5231	-5.5589	0.0941	2.8390	1.6926	0.2798	8.5627	20.1717	-0.0801	-2.5189									
06/05/2010	-3.6323	-0.1805	-3.2559	1.6114	-0.1957	-0.6286	-8.1162	0.1028	3.2043	19.8360	0.1741	5.3129									
07/05/2010	2.9617	0.1875	3.8749	3.4811	0.1662	5.2017	-4.5933	-0.2384	-7.4086	16.5897	0.3986	12.3700									
08/05/2010	-2.1893	-0.1878	-4.3586	-6.1810	-0.0252	-0.8374	6.4892	-0.1848	-5.8269	10.9670	0.5627	17.6564									
09/05/2010	1.3395	0.1811	4.6901	4.7651	-0.1289	-4.0451	6.9008	0.1695	5.3440	3.7953	0.6454	20.4452									
10/05/2010	-0.4435	-0.1682	-4.8579	-0.0843	0.1960	6.2536	-4.0114	0.2424	7.7511	-3.9100	0.6365	20.3446									
11/05/2010	-0.4674	0.1493	4.8562	-4.5954	-0.1301	-4.2132	-8.3408	-0.0804	-2.5557	-11.0547	0.5377	17.3383									
12/05/2010	1.3630	-0.1255	-4.6853	6.2269	-0.0208	-0.6262	1.0430	-0.2673	-8.6525	-16.5845	0.3627	11.8041									
13/05/2010	-2.2093	0.0973	4.3510	-3.6180	0.1572	5.0930	8.7117	-0.0147	-0.5101	-19.6204	0.1360	4.5009									
14/05/2010	2.9806	-0.0661	-3.8652	-1.3682	-0.1854	-6.0833	2.0713	0.2589	8.4796	-19.6057	-0.1088	-3.4944									
15/05/2010	-3.6456	0.0328	3.2447	5.4876	0.0902	0.1036	-7.9650	0.1072	3.5641	-16.4427	-0.3333	-10.9217									
16/05/2010	4.1859	0.0012	-2.5114	-5.8675	0.0656	2.1271	-4.9225	-0.2178	-7.1950	-10.5697	-0.5009	-16.5452									
17/05/2010	-4.5783	-0.0349	1.6907	2.3463	-0.1744	-5.7846	6.2187	-0.1830	-6.1143	-2.9278	-0.5835	-19.4013									
18/05/2010	4.8128	0.0670	-0.8113	2.8148	0.1665	5.5900	7.1360	0.1510	5.0257	5.2063	-0.5684	-19.0112									
19/05/2010	-4.8791	-0.0963	-0.0963	-6.0298	-0.0461	-1.5935	-3.6540	0.2356	7.9264	12.4825	-0.4601	-15.4810									
20/05/2010	4.7756	0.1221	1.0003	5.2266	-0.1032	-3.4313	-8.4495	-0.0654	-2.1705	17.7490	-0.2788	-9.4535									
21/05/2010	-4.5069	-0.1433	-1.8694	-0.8479	0.1836	6.1956	0.6419	-0.2573	-8.6916	20.2466	-0.0554	-1.9453									
22/05/2010	4.0802	0.1593	2.6735	-4.0439	-0.1392	-4.7448	8.6785	-0.0260	-0.9131	19.6908	0.1752	5.8625									
23/05/2010	-3.5134	-0.1697	-3.3845	6.2576	0.0025	0.1350	2.4635	0.2469	8.3743	16.2557	0.3792	12.8176									
24/05/2010	2.8229	0.1739	3.9778	-4.2097	0.1368	4.6146	-7.7896	0.1148	3.9331	10.4992	0.5285	17.9430									
25/05/2010	-2.0360	-0.1722	-4.4329	-0.6178	-0.1824	-6.2055	-5.2565	-0.2050	-6.9554	3.2635	0.6032	20.5363									
26/05/2010	1.1776	0.1644	4.7340	5.0843	0.1061	3.6532	5.9218	-0.1874	-6.4017	-4.4300	0.5931	20.2325									
27/05/2010	-0.2786	-0.1510	-4.8707	-6.0808	0.0426	1.4020	7.3666	0.1382	4.6811	-11.4894	0.4988	17.0426									
28/05/2010	-0.6294	0.1323	4.8384	3.0273	-0.1613	-5.4612	-3.2715	0.2372	8.0920	-16.8717	0.3319	11.3700									
29/05/2010	1.5166	-0.1092	-4.6383	2.1252	0.1726	5.8862	-8.5443	-0.0527	-1.7622	-19.7180	0.1152	3.9944									
30/05/2010	-2.3493	0.0823	4.2773	-5.7942	-0.0666	-2.3061	0.2205	-0.2565	-8.7124	-19.4994	-0.1197	-3.9944									
31/05/2010	3.1026	-0.0527	-3.7682	5.5999	-0.0835	-2.7840	8.6238	-0.0384	-1.3329	-16.1511	-0.3362	-11.3354									
01/06/2010	-3.7459	0.0213	3.1285	-1.5788	0.1792	6.0496	2.8683	0.2439	8.2444	-10.1434	-0.4981	-16.8064									
02/06/2010	4.2616	0.0108	-2.3805	-3.4488	-0.1532	-5.1933	-7.5877	0.1269	4.3099	-2.4409	-0.5777	-19.4709									
03/06/2010	-4.6278	-0.0425	1.5501	6.1983	0.0245	0.8738	-5.5934	-0.1995	-6.6880	5.6711	-0.5612	-18.8855									
04/06/2010	4.8349	0.0728	-0.6662	-4.7253	0.1230	4.0833	5.5971	-0.1989	-6.6867	12.8514	-0.4521	-15.1902									
05/06/2010	-4.8741	-0.1006	-0.2406	0.1211	-0.1870	-6.2359	7.5900	0.1299	4.3092	17.9698	-0.2693	-9.0532									
06/06/2010	4.7444	0.1251	1.1389	4.6207	0.1261	4.2239	-2.8637	0.2477	8.2451	20.2957	-0.0430	-1.5036									
07/06/2010	-4.4514	-0.1453	-1.9977	-6.2028	0.0219	0.6769	-8.6222	-0.0412	-1.3310	19.5724	0.1919	6.2778									
08/06/2010	4.0032	0.1607	2.7873	3.6475	-0.1552	-5.0700	-0.2203	-0.2650	-8.7121	15.9974	0.4013	13.1486									
09/06/2010	-3.4182	-0.1708	-3.4804	1.4252	0.1861	6.0926	8.5449	-0.0531	-1.7680	10.1449	0.5557	18.1479									
10/06/2010	2.7136	0.1750	4.0531	-5.4845	-0.0901	-2.9670	3.2838	0.2491	8.0875	2.8667	0.6334	20.5924									
11/06/2010	-1.9166	-0.1736	-4.4857	5.8863	-0.0670	-2.1162	-7.3575	0.1445	4.6921	-4.8125	0.6227	20.1372									
12/06/2010	1.0527	0.1661	4.7632	-2.2680	0.1823	5.8247	-5.9305	-0.2001	-6.3913	-11.8041	0.5228	16.8134									
13/06/2010	-0.1528	-0.1532	-4.8762	-2.8227	-0.1742	-5.5582	5.2435	-0.2184	-6.9664	-17.0741	0.3450	11.0420									
14/06/2010	-0.7518	0.1349	4.8208	6.0573	0.0487	1.5803	7.8032	0.1247	3.9097	-19.7786	0.1124	3.6178									
15/06/2010	1.6315	-0.1121	-4.5991	-5.1631	0.1134	3.5114	-2.4307	0.2673	8.3826	-19.4100	-0.1414	-4.3611									
16/06/2010	-2.4530	0.0853	4.2186	0.8382	-0.1995	-6.1812	-8.6803	-0.0292	-0.8778	-15.9277	-0.3766	-11.6337									
17/06/2010	3.1920	-0.0555</																			

	Tethys: x	y	z	Dione: x	y	z	Rhea: x	y	z	Titan: x	y	z
04/08/2010	-0.9220	0.2450	4.7868	-3.1618	-0.3200	-5.3655	-5.3234	0.4117	6.9063	-9.4776	-1.0262	-17.1570
05/08/2010	-1.7888	-0.2186	-4.5363	6.1436	0.0712	1.1981	-7.7596	-0.2415	-3.9768	-1.7120	-1.1830	-19.5333
06/08/2010	-2.5925	0.1841	4.1311	-4.9294	0.2361	3.8289	2.5355	-0.5105	-8.3277	6.3393	-1.1453	-14.8772
07/08/2010	3.3099	-0.1429	-3.1849	0.4342	-0.3866	-6.2129	8.6708	0.0626	0.9924	13.3608	-0.9173	-18.7602
08/08/2010	-3.9121	0.0959	2.9165	4.4090	0.2786	4.4376	0.6028	0.5472	8.6948	18.2669	-0.5356	-8.5389
09/08/2010	4.3828	-0.0447	-2.1487	-6.2279	0.0257	0.3805	-8.4499	0.1375	2.1716	20.3737	-0.0605	-0.9842
10/08/2010	-4.7023	-0.0092	1.3077	3.8783	-0.3170	-4.8881	-3.6544	-0.5109	-7.9003	19.4613	0.4362	6.7208
	4.8624	0.0641	-0.4222	1.1498	0.4019	6.1401	7.1409	-0.3266	-5.0015	15.7481	0.8822	13.4613
12/08/2010	-4.8562	-0.1181	-0.4776	-5.3491	-0.2111	-3.1987	6.2272	0.4053	6.1059	9.8160	1.2136	18.3045
13/08/2010	4.6841	0.1694	1.3609	5.9709	-0.1264	-1.8611	-4.8771	0.4843	7.2243	2.5152	1.3816	20.5904
14/08/2010	-4.3532	-0.2162	-2.1977	-2.5065	0.3895	5.7156	-7.9961	-0.2374	-3.4777	-5.1355	1.3578	19.9921
15/08/2010	3.8726	0.2569	2.9595	-2.5973	-0.3894	-5.6563	2.0015	-0.5830	-8.4670	-12.0548	1.1379	16.5538
16/08/2010	-3.2613	-0.2901	-3.6202	5.9914	0.1250	1.8107	8.7163	0.0318	0.4415	-17.2173	0.7445	10.7080
17/08/2010	2.5376	0.3142	4.1575	-5.2919	0.2349	3.3076	1.1541	0.6096	8.6347	-19.7918	0.2279	3.2589
18/08/2010	-1.7284	-0.3286	-4.5529	1.0637	-0.4393	-6.1341	-8.2945	0.1922	2.7025	-19.2891	-0.3375	-4.6895
19/08/2010	0.8599	0.3321	4.7932	3.9393	0.3508	4.8547	-4.1523	-0.5541	-7.6476	-15.6926	-0.8619	-11.8794
20/08/2010	0.0381	-0.3249	-4.8700	-6.2337	-0.0170	-0.2505	6.8059	-0.3981	-5.4433	-9.5203	-1.2559	-17.1164
21/08/2010	-0.9339	0.3065	4.7809	4.3534	-0.3329	-4.4711	6.6053	0.4228	5.6931	-1.7671	-1.4485	-19.5142
22/08/2010	1.7993	-0.2776	-4.5290	0.5267	0.4670	6.2192	-4.4040	0.5635	7.5170	6.2807	-1.4030	-18.6880
23/08/2010	-2.6015	0.2387	4.1227	-4.9978	-0.2817	-3.7187	-8.2035	-0.2256	-2.9569	13.3107	-1.1254	-14.8259
24/08/2010	3.3171	-0.1910	-3.5761	6.1288	-0.0979	-1.2539	1.4513	-0.6590	-8.5727	18.2389	-0.6607	-8.6186
25/08/2010	-3.9175	0.1358	2.9077	-3.0673	0.4235	5.4311	8.7266	-0.0082	-0.1186	20.3799	-0.0825	-1.0898
26/08/2010	4.3864	-0.0750	-2.1404	-2.0134	-0.4633	-5.8847	1.7086	0.6719	8.5376	19.5089	0.5218	6.6042
27/08/2010	-4.7043	0.0102	1.3004	5.7809	0.1897	2.3965	-8.1026	0.2561	3.2288	15.8367	1.0645	13.3524
28/08/2010	4.8630	0.0562	-0.4161	-5.5964	0.2237	2.7593	-4.6397	-0.5935	-7.3593	9.9369	1.4679	18.2216
29/08/2010	-4.8557	-0.1223	-0.4822	1.6751	-0.4894	-5.9935	6.4382	-0.4774	-5.8672	2.6531	1.6733	20.5479
30/08/2010	4.6827	0.1856	1.3639	3.4357	0.4296	5.2172	6.9637	0.4335	5.2514	-4.9997	1.6463	19.9971
31/08/2010	-4.3511	-0.2441	-2.1990	-6.1765	-0.0713	-0.8710	-3.9066	0.6479	7.7809	-11.9402	1.3819	16.6052
01/09/2010	3.8701	0.2956	2.9591	4.7797	-0.3398	-4.0137	-8.3790	-0.2048	-2.4178	17.1395	0.9078	10.7968
02/09/2010	-3.2587	-0.3384	-3.6184	-0.0952	0.5319	6.2346	0.8886	-0.7368	-8.6427	-19.7602	0.2850	3.3704
03/09/2010	2.5350	0.3706	4.1544	-4.5998	-0.3610	-4.1948	8.7002	-0.0580	-0.6839	-19.3056	-0.3964	-4.5730
04/09/2010	-1.7261	-0.3912	-4.5489	6.2243	-0.0573	-0.6411	2.2620	0.7322	8.4028	-15.7527	-1.0284	-11.7761
05/09/2010	0.8579	0.3989	4.7884	-3.5924	0.4500	5.0950	-7.8744	0.3290	3.7460	-9.6135	-1.5035	-17.0429
06/09/2010	0.0396	-0.3937	-4.8649	-1.4147	-0.5392	-6.0509	-5.1123	-0.6273	-7.0365	-1.8788	-1.7366	-19.4843
07/09/2010	-0.9350	0.3748	4.7759	5.5152	0.2647	2.9520	6.0395	-0.5637	-6.2693	6.1688	-1.6847	-18.7108
08/09/2010	1.7999	-0.3432	-4.5242	-5.8427	0.2006	2.1889	7.2900	0.4359	4.7831	13.2189	-1.3551	-14.9037
09/09/2010	-2.6017	0.2992	4.1186	2.2647	-0.5338	-5.7940	-3.3878	0.7360	8.0131	18.1868	-0.8022	-8.7448
10/09/2010	3.3170	-0.2445	-3.5729	2.9024	0.5130	5.5242	-8.5201	-0.1741	-1.8641	20.3824	-0.1137	-1.2488
11/09/2010	-3.9172	0.1804	2.9057	-6.0585	-0.1375	-1.4770	0.3172	-0.8145	-8.6754	19.5726	0.6061	6.4353
12/09/2010	4.3861	-0.1090	-2.1397	5.1558	-0.3354	-3.5205	8.6363	-0.1176	-1.2500	15.9579	1.2529	13.1992
13/09/2010	-4.7041	0.0325	1.3010	-0.7117	0.5934	6.1879	2.8101	0.7886	8.2304	10.1018	1.7348	18.1081
14/09/2010	4.8629	0.0466	-0.4181	-4.1588	-0.4472	-4.6248	-7.6106	0.4104	4.2500	2.8397	1.9819	20.4917
15/09/2010	-4.8559	-0.1257	-0.4788	6.2583	-0.0040	-0.0269	-5.5664	-0.6539	-6.6809	-4.8175	1.9536	20.0062
16/09/2010	4.6833	0.2020	1.3593	-4.0790	0.4663	4.7109	5.6118	-0.6556	-6.6459	-11.7878	1.6441	16.6768
17/09/2010	-4.3522	-0.2730	-2.1935	-8.8055	-0.6143	-6.1554	7.5900	0.4287	2.2915	-17.0375	1.0862	10.9181
18/09/2010	3.8716	0.3360	2.9528	5.1974	0.3490	3.4745	-2.8512	0.8261	8.2112	-19.7205	0.3522	3.5212
19/09/2010	-3.2607	-0.3891	-3.6115	-6.0304	0.1641	1.6005	-8.6251	-0.1331	-1.2998	-19.3306	-0.4513	-4.4168
20/09/2010	2.5375	0.4298	4.1472	2.8294	-0.5697	-5.5382	-0.2587	-0.8901	-15.8353	-1.1969	-11.6387	-19.5333
21/09/2010	-1.7289	-0.4570	-4.5417	2.3432	0.5983	5.7750	8.5346	-0.1868	-1.8126	-9.7390	-1.7581	-16.9461
22/09/2010	0.8609	0.4691	4.7815	-5.8813	-0.2149	-2.0647	3.3487	0.8390	8.0211	-0.2065	-2.0355	-19.4448
23/09/2010	0.0365	-0.4658	-4.8586	5.4802	-0.3177	-2.9952	-7.3125	0.4991	4.7366	6.0231	-1.9790	-18.7385
24/09/2010	-0.9319	0.4465	4.7703	-1.3193	0.6486	6.0804	-5.9979	-0.6715	-6.2948	13.1007	-1.5976	-14.9990
25/09/2010	1.7969	-0.4120	-4.5196	-3.6782	-0.5382	-5.0066	5.1581	-0.7516	-6.9938	18.1190	-0.9550	-8.8978
26/09/2010	-2.5990	0.3628	4.1152	6.2315	0.0622	0.5847	7.8579	0.4110	3.7801	20.3813	-0.1538	-1.4391
27/09/2010	3.3147	-0.3007	-3.5708	-4.5249	0.4701	4.2819	-2.3006	0.9161	8.3730	19.6443	0.6847	6.2349
28/09/2010	-3.9154	0.2272	2.9049	-0.1895	-0.6855	-6.1985	-8.6927	-0.0815	-0.7291	16.0966	1.4392	13.0187
29/09/2010	4.3848	-0.1448	-2.1402	4.8296	0.4408	3.9609	-8.8349	-0.9616	-8.6257	10.2901	2.0029	17.9745
30/09/2010	-4.7033	0.0561	1.3028	-6.1589	0.1136	0.9983	8.3954	-0.2652	-2.3673	3.0520	2.2946	20.4243
01/10/2010	4.8627	0.0359	-0.4212	3.3659	-0.5943	-5.2285	3.8735	0.8819	7.7763	-4.6110	2.2671	20.0135
02/10/2010	-4.8563	-0.1283	-0.4747	1.7615	0.6827	5.9684	-6.9820	0.5940	5.2020	-11.6158	1.9136	16.7551
03/10/2010	4.6841	0.2179	1.3542	-5.6464	-0.3026	-2.6305	-6.4037	-0.6792	-5.8810	-16.9226	1.2723	11.0527
04/10/2010	-4.3533	-0.3016	-2.1874	5.7513	-0.2855	-2.4416	4.6814	-0.8499	-7.3102	-19.6759	0.4268	3.6891
05/10/2010	3.8730	0.3764	2.9461	-1.9144	0.6944	5.9135	8.0917	0.3823	3.2527	-19.3584	-0.4999	-4.2426
06/10/2010	-3.2622	-0.4398	-3.6043	-3.1611	-0.6313	-5.3383	-1.7399	1.0042	8.4976	-15.9269	-1.3605	-11.4852
07/10/2010	2.5390	0.4891	4.1397	6.1441	0.1407	1.1899	-8.7224	-0.0197	-0.1565	-9.8772	-2.0096	-16.8372
08/10/2010	-1.7302	-0.5229	-4.5340	-4.9272	0.4594	3.8111	-1.4070	-0.0272	-8.5433	-2.1883	-2.3332	-19.3985
09/10/2010	0.8620	0.5392	4.7739	0.4295	-0.7497	-6.1801	8.2196	-0.3516	-2.9098	5.8645	-2.2741	-18.7646
10/10/2010	0.0357	-0.5379	-4.8511	4.4142	0.5378	4.4085	4.3809	0.9157	7.4979	12.9724	-1.8430	-15.0976
11/10/2010	-0.9314	0.5180	4.7631	-6.2273	0.0488	0.3860	-6.6217	0.6934	5.6427	18.0448	-1.1129	-9.0573
12/10/2010	1.7969	-0.4806	-4.5129	3.8710	-0.6051	-4.8670	-6.7807	-0.6758	-5.4428	20.3776	-0.2008	-1.6381
13/10/2010	-2.5993	0.4260	4.1090	1.1609	0.7630	6.1035	4.1855	-0.9486	-7.5930	19.7164	0.7550	6.0253
14/10/2010	3.3152	-0.3564	-3.5651	-5.3549	-0.3986	-3.1709	8.2897	0.3426	2.7135	16.2375	1.6164	12.8293
15/10/2010	-3.9161	0.2735	2.8999	5.9671	-0.2378	-1.8631	-1.1733	1.0884	8.5841	10.4816	2.2618	17.8329
16/10/2010	4.3855	-0.1803	-2.1359	-2.4934	0.7280	5.6879	-8.7139	0.0519	0.4137	3.2673	2.5990	20.3501
17/10/2010	-4.7040	0.0796	1.2993	-2.6102	-0.7235	-5.6175	-1.9709	-1.0850	-8.4239	-4.4024	2.5741	20.0149
18/10/2010	4.8630	0.0252	-0.4185	5.9962	0.2305	1.7849	8.0090	-0.4447	-3.4363	-11.4426	2.1794	16.8280
19/10/2010	-4.8560	-0.1307	-0.4764	-5.2832	0.4325	3.3011	4.8671	0.9391	7.1886	-16.8071	1.4578	11.1822
20/10/2010	4.6831	0.2332	1.3550	1.0478	-0.8035	-6.1001	-6.2345	0.7955	6.0557	-19.6304	0.5043	3.8522
21/10/2010	-4.3514	-0.3292	-2.1872	3.9530	0.6374	4.8142	-7.1263	-0.6611	-4.9841	-19.3839	-0.5417	-4.0725
22/10/2010	3.8701	0.4153	2.9447	-6.2342	-0.0298	-0.2324	3.6743	-1.0455	-7.8404	-16.0141	-1.5142	-11.3345
23/10/2010	-3.2581	-0.4886	-3.6017	4.3411	-0.5999	-4.4556	8.4508	0.2919	2.1669	-1		

	Tethys: x y z			Dione: x y z			Rhea: x y z			Titan: x y z		
24/11/2010	-4.3259	-0.3805	-2.2290	-5.8686	-0.3337	-2.0845	6.5404	0.9166	5.7109	-10.1708	-2.6609	-16.5702
25/11/2010	3.8343	0.4852	2.9805	5.4997	-0.4750	-2.9388	-4.4918	1.1895	7.3897	-2.5281	-3.1061	-19.2641
26/11/2010	-3.2127	-0.5744	-3.6298	-1.3619	0.9760	6.0267	-8.1649	-0.4908	-3.0279	5.5352	-3.0408	-18.7858
27/11/2010	2.4794	0.6444	4.1545	-3.6390	-0.8123	-4.9984	1.5625	-1.3759	-8.4682	12.7094	-2.4818	-15.2766
28/11/2010	-1.6621	-0.6933	-4.5367	6.2267	0.1019	0.6308	8.7286	0.0000	-0.0060	17.8958	-1.5274	-9.3731
29/11/2010	0.7871	0.7183	4.7632	-4.5628	0.6910	4.2105	1.5956	1.3872	8.4727	20.3739	-0.3328	-2.0466
30/11/2010	0.1151	-0.7195	-4.8263	-0.1292	-1.0133	-6.1553	-8.1457	0.5060	3.0841	19.8659	0.9201	5.5837
01/12/2010	-1.0127	0.6955	4.7238	4.7890	0.6566	3.9803	-4.5305	-1.2141	-7.3508	16.5220	2.0506	12.4191
02/12/2010	1.8770	-0.6481	-4.4591	-6.1693	0.1543	0.9239	6.5268	-0.9458	-5.7124	10.8595	2.9002	17.5106
03/12/2010	-2.6750	0.5776	4.0412	3.4274	-0.8583	-5.1519	6.8805	0.8822	5.3017	3.6819	3.3490	20.1539
04/12/2010	3.3835	-0.4872	-3.4847	1.6876	0.9928	5.9460	-4.0287	1.2739	7.6388	-4.0113	3.3278	19.9587
05/12/2010	-3.9736	0.3792	2.8084	-5.6107	-0.4492	-2.6852	-8.3362	-0.4249	-2.5308	-11.1267	2.8274	16.9010
06/12/2010	4.4292	-0.2576	-2.0356	5.7851	-0.3956	-2.3453	1.0400	-1.4353	-8.5381	-16.5997	1.9054	11.3536
07/12/2010	-4.7310	0.1263	1.1930	-2.0013	0.9864	5.8424	8.7123	-0.0875	-0.5248	-19.5415	0.6859	4.0813
08/12/2010	4.8712	0.0102	-0.3093	-3.0767	-0.9055	-5.3483	2.1082	1.4134	8.3555	-19.4021	-0.6499	-3.8275
09/12/2010	-4.8437	-0.1472	-0.5850	6.1241	0.2163	1.2795	-7.9438	0.6028	3.5576	-16.1139	-1.8885	-11.1093
10/12/2010	4.6491	0.2800	1.4591	-4.9921	0.6314	3.6996	-4.9684	-1.2038	-7.0642	-10.1593	-2.8215	-16.5515
11/12/2010	-4.2956	-0.4040	-2.2830	0.5422	-1.0482	-6.1280	6.1699	-1.0381	-6.0807	-2.5119	-3.2896	-19.2417
12/12/2010	3.7928	0.5148	3.0284	4.3301	0.7637	4.4583	7.1872	0.8376	4.8854	5.5542	-3.2162	-18.7615
13/12/2010	-3.1609	-0.6088	-3.6695	-6.2335	0.0460	0.2612	-3.5637	1.3487	7.8544	12.7281	-2.6213	-15.2540
14/12/2010	2.4186	0.6820	4.1842	3.9721	-0.8208	-4.7533	-8.4733	-0.3524	-2.0393	17.9121	-1.6108	-9.3560
15/12/2010	-1.5941	-0.7326	-4.5549	1.0282	1.0520	6.0840	0.5282	-1.4825	-8.5768	20.3859	-0.3498	-2.0375
16/12/2010	0.7140	0.7578	4.7686	-5.2809	-0.5660	-3.2679	8.6660	-0.1769	-1.0266	19.8719	0.9697	5.5840
17/12/2010	0.1910	-0.7577	-4.8181	6.0099	-0.2988	-1.7119	2.5990	1.4268	8.2137	16.5198	2.1570	12.4106
18/12/2010	-1.0886	0.7309	4.7015	-2.6328	0.9744	5.5868	-7.7204	0.6965	4.0048	10.8468	3.0461	17.4928
19/12/2010	1.9503	-0.6793	-4.4228	-2.4641	-0.9863	-5.6436	-5.3765	-1.1818	-6.7629	3.6578	3.5118	20.1251
20/12/2010	-2.7429	0.6037	3.9916	5.9467	0.3368	1.9283	5.8025	-1.1229	-6.4174	-4.0445	3.4828	19.9159
21/12/2010	3.4433	-0.5073	-3.4227	-5.3727	0.5512	3.1338	7.4604	0.7843	4.4663	-11.1625	2.9516	16.8415
22/12/2010	-4.0227	0.3927	2.7357	1.2240	-1.0616	-6.0279	-3.1010	1.4126	8.0377	-16.6270	1.9803	11.2774
23/12/2010	4.4653	-0.2643	-1.9543	3.8077	0.8628	4.8954	-8.5780	-0.2754	-1.5571	-19.5469	0.7014	3.9935
24/12/2010	-4.7523	0.1262	1.1053	-6.2237	-0.0733	-0.4204	0.0307	-1.5170	-8.5868	-19.3740	-0.6939	-3.9156
25/12/2010	4.8761	0.0168	-0.2182	4.4825	-0.7606	-4.2886	8.5928	-0.2660	-1.5084	-16.0471	-1.9817	-11.1820
26/12/2010	-4.8314	-0.1598	-0.6765	0.3392	1.0919	6.1531	3.0655	1.4275	8.0511	-10.0581	-2.9455	-16.5927
27/12/2010	4.6192	0.2978	1.5478	-4.8775	-0.6796	-3.8254	-7.4794	0.7850	4.4243	-2.3901	-3.4213	-19.2404
28/12/2010	-4.2484	-0.4260	-2.3658	6.1669	-0.1867	-1.0422	-5.7537	-1.1491	-6.4512	5.6772	-3.3329	-18.7150
29/12/2010	3.7293	0.5399	3.1019	-3.2486	0.9387	5.2574	5.4291	-1.1983	-6.7229	12.8324	-2.7047	-15.1685
30/12/2010	-3.0827	-0.6357	-3.7309	-1.8044	-1.0507	-5.8773	7.7009	0.7238	4.0486	17.9811	-1.6495	-9.2441
31/12/2010	2.3279	0.7095	4.2309	5.6907	0.4592	2.5701	-2.6445	1.4642	8.1905	20.4091	-0.3403	-1.9155

Distanze in raggi di Saturno - Distance in saturnian radii

# FENOMENI MUTUI DEI SATELLITI DI SATURNO

## MUTUAL PHENOM. OF THE SATELLITES OF SATURN

Ec.D. : inizio dell'eclisse  
 Ec.R. : fine dell'eclisse  
 Oc.D. : inizio dell'occultazione  
 Oc.R. : fine dell'occultazione  
 Tr.I. : inizio del transito  
 Tr.E. : fine del transito  
 Sh.I. : ingresso dell'ombra  
 Sh.E. : uscita dell'ombra

TEMPI IN T.U.

Sono stati presi in considerazione solo i 4 satelliti principali

Ec.D. : beginning of the eclipse  
 Ec.R. : ending of the eclipse  
 Oc.D. : beginning of the occultation  
 Oc.R. : ending of the occultation  
 Tr.I. : beginning of the transit  
 Tr.E. : ending of the transit  
 Sh.I. : beginning of the umbra transit  
 Sh.E. : ending of the umbra transit

TIMES IN U.T.

Only the 4 main satellites

Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
01/01/2010	0.36.47	Rhea	Tr.	E.	19.8	-64.6	09/01/2010	12.12.04	Dione	Ec.	D.	-20.8	24.8	17/01/2010	17.17.38	Dione	Ec.	D.	-42.8	-12.9
01/01/2010	7.06.35	Dione	Ec.	D.	38.1	3.5	09/01/2010	16.07.02	Dione	Occ.	R.	-47.7	-1.4	17/01/2010	18.55.58	Tethys	Occ.	R.	-29.7	-30.9
01/01/2010	11.03.29	Dione	Occ.	R.	-2.0	25.0	09/01/2010	18.25.22	Titan	Sh.	I.	-38.7	-26.6	17/01/2010	21.09.54	Dione	Occ.	R.	-6.2	-54.9
01/01/2010	14.26.06	Tethys	Sh.	I.	-37.0	11.6	09/01/2010	20.58.56	Rhea	Sh.	I.	-14.0	-54.6	17/01/2010	21.17.37	Titan	Ec.	D.	-4.6	-56.2
01/01/2010	15.15.22	Tethys	Tr.	I.	-42.9	4.9	09/01/2010	21.08.14	Titan	Sh.	E.	-12.3	-56.1	17/01/2010	22.22.31	Titan	Ec.	R.	7.5	-65.2
01/01/2010	17.18.39	Tethys	Sh.	E.	-47.1	-15.7	09/01/2010	23.14.33	Rhea	Tr.	I.	11.2	-70.0	18/01/2010	14.14.04	Tethys	Sh.	I.	-43.3	16.1
01/01/2010	17.50.00	Tethys	Tr.	E.	-45.4	-21.3	10/01/2010	0.37.31	Rhea	Sh.	E.	25.9	-64.2	18/01/2010	14.59.34	Tethys	Tr.	I.	-46.7	10.0
01/01/2010	21.12.24	Titan	Ec.	D.	-17.1	-58.1	10/01/2010	1.27.48	Rhea	Tr.	E.	33.9	-56.5	18/01/2010	17.05.44	Tethys	Sh.	E.	-43.5	-10.6
02/01/2010	0.04.09	Titan	Ec.	R.	14.6	-68.4	10/01/2010	2.20.03	Tethys	Ec.	D.	41.0	-47.4	18/01/2010	17.35.00	Tethys	Tr.	E.	-40.5	-15.8
02/01/2010	13.05.25	Tethys	Ec.	D.	-25.3	20.4	10/01/2010	5.42.52	Tethys	Occ.	R.	43.8	-10.4	18/01/2010	21.54.18	Rhea	Sh.	I.	3.1	-61.5
02/01/2010	15.52.56	Dione	Sh.	I.	-46.2	-0.3	10/01/2010	20.58.27	Dione	Sh.	I.	-13.4	-54.3	19/01/2010	0.02.35	Rhea	Tr.	I.	26.0	-66.8
02/01/2010	16.29.18	Tethys	Occ.	R.	-47.6	-7.0	10/01/2010	22.09.49	Dione	Tr.	I.	0.4	-65.1	19/01/2010	1.30.29	Rhea	Sh.	E.	39.3	-55.5
02/01/2010	17.06.09	Dione	Tr.	I.	-47.4	-13.4	11/01/2010	0.11.44	Dione	Sh.	E.	22.2	-67.1	19/01/2010	2.04.03	Dione	Sh.	I.	43.2	-49.8
02/01/2010	19.07.04	Dione	Sh.	E.	-36.7	-35.4	11/01/2010	0.52.25	Dione	Tr.	E.	29.0	-62.0	19/01/2010	2.18.28	Rhea	Tr.	E.	44.6	-47.3
02/01/2010	19.48.58	Dione	Tr.	E.	-30.6	-43.1	11/01/2010	0.59.23	Tethys	Sh.	I.	30.1	-61.0	19/01/2010	3.11.50	Dione	Tr.	I.	47.9	-37.6
03/01/2010	2.17.45	Rhea	Ec.	D.	37.2	-47.8	11/01/2010	1.47.09	Tethys	Tr.	I.	37.3	-53.2	19/01/2010	5.16.25	Dione	Sh.	E.	42.9	-14.6
03/01/2010	6.50.25	Rhea	Occ.	R.	39.2	1.2	11/01/2010	3.51.27	Tethys	Sh.	E.	48.1	-30.6	19/01/2010	5.55.12	Dione	Tr.	E.	38.3	-7.8
03/01/2010	11.44.45	Tethys	Sh.	I.	-11.7	24.9	11/01/2010	4.21.57	Tethys	Tr.	E.	48.2	-24.9	19/01/2010	12.53.24	Tethys	Ec.	D.	-33.8	24.3
03/01/2010	12.33.50	Tethys	Tr.	I.	-20.5	22.8	11/01/2010	23.38.43	Tethys	Ec.	D.	17.0	-69.3	19/01/2010	16.14.10	Tethys	Occ.	R.	-46.8	-0.8
03/01/2010	14.37.12	Tethys	Sh.	E.	-39.5	10.4	12/01/2010	3.01.11	Tethys	Occ.	R.	45.8	-39.9	20/01/2010	10.59.30	Dione	Ec.	D.	-15.6	27.7
03/01/2010	15.08.27	Tethys	Tr.	E.	-43.0	6.1	12/01/2010	3.13.03	Rhea	Ec.	D.	46.6	-37.7	20/01/2010	11.32.44	Tethys	Sh.	I.	-21.4	27.9
04/01/2010	0.48.24	Dione	Ec.	D.	23.8	-62.9	12/01/2010	5.53.55	Dione	Ec.	D.	41.8	-8.5	20/01/2010	12.17.33	Tethys	Tr.	I.	-28.9	26.7
04/01/2010	4.44.45	Dione	Occ.	R.	48.3	-20.8	12/01/2010	7.41.22	Rhea	Occ.	R.	26.3	8.9	20/01/2010	14.24.19	Tethys	Sh.	E.	-44.9	15.2
04/01/2010	10.24.04	Tethys	Ec.	D.	2.8	24.2	12/01/2010	9.48.04	Dione	Occ.	R.	3.7	22.9	20/01/2010	14.50.43	Dione	Occ.	R.	-46.6	11.7
04/01/2010	13.47.44	Tethys	Occ.	R.	-33.2	16.6	12/01/2010	22.18.03	Tethys	Sh.	I.	3.1	-65.7	20/01/2010	14.53.11	Tethys	Tr.	E.	-46.7	11.3
05/01/2010	8.31.18	Rhea	Sh.	I.	22.4	14.9	12/01/2010	23.05.20	Tethys	Tr.	I.	11.7	-69.3	21/01/2010	4.08.28	Rhea	Ec.	D.	47.5	-26.9
05/01/2010	9.03.24	Tethys	Sh.	I.	16.7	18.4	13/01/2010	1.10.01	Tethys	Sh.	E.	33.0	-59.3	21/01/2010	8.31.55	Rhea	Occ.	R.	11.1	16.6
05/01/2010	9.34.46	Dione	Sh.	I.	11.1	21.2	13/01/2010	1.40.15	Tethys	Tr.	E.	37.4	-54.3	21/01/2010	10.12.04	Tethys	Ec.	D.	-7.6	26.0
05/01/2010	9.52.15	Tethys	Tr.	I.	7.9	22.5	13/01/2010	14.40.19	Dione	Sh.	I.	-44.0	11.7	21/01/2010	13.32.21	Tethys	Occ.	R.	-40.1	21.4
05/01/2010	10.47.33	Dione	Tr.	I.	-1.9	25.1	13/01/2010	15.50.40	Dione	Tr.	I.	-47.6	1.5	21/01/2010	19.45.56	Dione	Sh.	I.	-18.5	-39.4
05/01/2010	10.48.54	Rhea	Tr.	I.	-2.2	25.1	13/01/2010	17.53.17	Dione	Sh.	E.	-40.7	-20.0	21/01/2010	20.52.09	Dione	Tr.	I.	-6.5	-51.2
05/01/2010	11.55.46	Tethys	Sh.	E.	-15.1	24.8	13/01/2010	18.33.25	Dione	Tr.	E.	-35.5	-27.4	21/01/2010	22.57.59	Dione	Sh.	E.	16.9	-67.1
05/01/2010	12.11.02	Rhea	Sh.	E.	-17.9	24.3	13/01/2010	20.57.23	Tethys	Ec.	D.	-11.4	-53.6	21/01/2010	23.35.59	Dione	Tr.	E.	23.5	-67.6
05/01/2010	12.26.52	Tethys	Tr.	E.	-20.7	23.5	14/01/2010	0.19.28	Tethys	Occ.	R.	25.5	-66.0	22/01/2010	8.51.25	Tethys	Sh.	I.	6.8	19.1
05/01/2010	12.48.37	Dione	Sh.	E.	-24.4	22.1	14/01/2010	9.26.36	Rhea	Sh.	I.	6.1	21.4	22/01/2010	9.35.28	Tethys	Tr.	I.	-0.8	23.5
05/01/2010	13.02.20	Rhea	Tr.	E.	-26.7	21.1	14/01/2010	11.39.06	Rhea	Tr.	I.	-18.4	26.6	22/01/2010	11.42.54	Tethys	Sh.	E.	-24.5	28.2
05/01/2010	13.30.11	Dione	Tr.	E.	-31.2	18.5	14/01/2010	13.04.00	Rhea	Sh.	E.	-32.5	22.5	22/01/2010	12.11.21	Tethys	Tr.	E.	-29.2	27.4
06/01/2010	7.42.44	Tethys	Ec.	D.	29.9	8.7	14/01/2010	13.53.11	Rhea	Tr.	E.	-39.3	17.7	23/01/2010	4.41.23	Dione	Ec.	D.	44.8	-20.6
06/01/2010	11.06.08	Tethys	Occ.	R.	-6.8	25.5	14/01/2010	19.36.43	Tethys	Sh.	I.	-24.9	-38.9	23/01/2010	7.30.46	Tethys	Ec.	D.	20.7	8.5
06/01/2010	18.30.14	Dione	Ec.	D.	-39.5	-28.0	14/01/2010	20.23.28	Tethys	Tr.	I.	-16.8	-47.5	23/01/2010	8.31.27	Dione	Occ.	R.	9.8	16.9
06/01/2010	22.25.55	Dione	Occ.	R.	0.5	-67.6	14/01/2010	22.28.35	Tethys	Sh.	E.	6.4	-66.4	23/01/2010	10.22.03	Rhea	Sh.	I.	-10.9	27.0
07/01/2010	6.22.04	Tethys	Sh.	I.	40.8	-3.5	14/01/2010	22.58.32	Tethys	Tr.	E.	11.9	-68.7	23/01/2010	10.50.30	Tethys	Occ.	R.	-16.1	28.1
07/01/2010	7.10.36	Tethys	Tr.	I.	34.2	4.1	14/01/2010	23.35.46	Dione	Ec.	D.	18.6	-69.0	23/01/2010	12.25.02	Rhea	Tr.	I.	-31.9	27.0
07/01/2010	9.14.19	Tethys	Sh.	E.	13.4	19.6	15/01/2010	3.29.01	Dione	Occ.	R.	47.9	-34.6	23/01/2010	13.56.57	Rhea	Sh.	E.	-43.6	19.2
07/01/2010	9.45.15	Tethys	Tr.	E.	7.7	22.2	15/01/2010	18.16.03	Tethys	Ec.	D.	-36.8	-23.8	23/01/2010	14.43.36	Rhea	Tr.	E.	-46.8	13.3
07/01/2010	14.45.23	Rhea	Ec.	D.	-42.2	9.9	15/01/2010	21.37.44	Tethys	Occ.	R.	-1.7	-59.7	24/01/2010	6.10.07	Tethys	Sh.	I.	33.3	-4.5
07/01/2010	19.15.56	Rhea	Occ.	R.	-32.7	-36.3	16/01/2010	8.22.10	Dione	Sh.	I.	16.4	14.7	24/01/2010	6.53.20	Tethys	Tr.	I.	26.4	2.9
08/01/2010	3.16.37	Dione	Sh.	I.	45.8	-37.1	16/01/2010	9.31.20	Dione	Tr.	I.	3.9	22.1	24/01/2010	9.01.29	Tethys	Sh.	E.	3.6	20.6
08/01/2010	4.28.47	Dione	Tr.	I.	48.3	-23.7	16/01/2010	11.34.51	Dione	Sh.	E.	-19.1	27.1	24/01/2010	9.29.29	Tethys	Tr.	E.	-1.1	23.4
08/01/2010	5.01.23	Tethys	Ec.	D.	47.4	-17.8	16/01/2010	12.14.21	Dione	Tr.	E.	-25.8	26.0	24/01/2010	13.27.49	Dione	Sh.	I.	-40.9	22.5
08/01/2010	6.30.10	Dione	Sh.	E.	39.3	-1.7	16/01/2010	15.40.44	Rhea	Ec.	D.	-47.7	3.5	24/01/2010	14.32.17	Dione	Tr.	I.	-46.4	15.1
08/01/2010	7.11.20	Dione	Tr.	E.	33.5	4.3	16/01/2010	16.55.23	Tethys	Sh.	I.	-45.1	-9.2	24/01/2010	16.39.33	Dione	Sh.	E.	-43.7	-4.7
08/01/2010	8.24.31	Tethys	Occ.	R.	21.5	14.3	16/01/2010	17.41.33	Tethys	Tr.	I.	-40.6	-17.4	24/01/2010	17.16.41	Dione	Tr.	E.	-39.7	-11.4
09/01/2010	3.40.43	Tethys	Sh.	I.	47.5	-32.6	16/01/2010	19.47.10	Tethys	Sh.	E.	-21.8	-40.5	25/01/2010	4.49.27	Tethys	Ec.	D.	43.3	-19.0
09/01/2010	4.28.54	Tethys	Tr.	I.	48.2	-23.7	16/01/2010	20.06.42	Rhea	Occ.	R.	-18.4	-44.1	25/01/2010	8.08.38	Tethys	Occ.	R.	12.5	14.2
09/01/2010	6.32.53	Tethys	Sh.	E.	38.4	-1.2	16/01/2010	20.16.47	Tethys	Tr.	E.	-16.6	-45.9	25/01/2010	16.36.15	Rhea	Ec.	D.	-43.6	-3.8
09/01/2010	7.03.37	Tethys	Tr.	E.	34.1	3.2	17/01/2010	15.34.43	Tethys	Ec.	D.	-47.6	4.6	25/01/2010	18.19.15	Titan	Sh.	I.	-30.4	-22.6

Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
25/01/2010	19.31.35	Titan	Sh.	E.	-18.2	-35.9	07/02/2010	5.57.30	Dione	Sh.	I.	26.5	-4.5	19/02/2010	16.35.59	Rhea	Sh.	E.	-30.2	1.9
25/01/2010	20.57.00	Rhea	Occ.	R.	-1.9	-51.2	07/02/2010	6.50.40	Dione	Tr.	I.	17.2	4.9	19/02/2010	16.58.56	Tethys	Tr.	I.	-26.5	-1.8
25/01/2010	22.23.16	Dione	Ec.	D.	13.5	-63.4	07/02/2010	9.07.32	Dione	Sh.	E.	-8.2	24.4	19/02/2010	17.09.40	Rhea	Tr.	E.	-24.7	-4.4
26/01/2010	2.12.07	Dione	Occ.	R.	46.3	-47.7	07/02/2010	9.39.08	Dione	Tr.	E.	-14.0	27.7	19/02/2010	17.14.50	Dione	Occ.	R.	-23.9	-5.4
26/01/2010	3.28.48	Tethys	Sh.	I.	48.2	-33.8	07/02/2010	10.00.26	Tethys	Ec.	D.	-17.8	29.4	19/02/2010	19.22.13	Tethys	Sh.	E.	-0.2	-28.9
26/01/2010	4.11.09	Tethys	Tr.	I.	46.3	-25.9	07/02/2010	13.14.45	Tethys	Occ.	R.	-44.9	27.6	19/02/2010	19.40.43	Tethys	Tr.	E.	2.8	-32.3
26/01/2010	6.20.04	Tethys	Sh.	E.	30.6	-2.0	08/02/2010	5.59.53	Rhea	Ec.	D.	25.4	-3.7	20/02/2010	15.11.44	Tethys	Ec.	D.	-41.0	16.2
26/01/2010	6.47.36	Tethys	Tr.	E.	26.1	2.3	08/02/2010	8.39.48	Tethys	Sh.	I.	-3.5	21.4	20/02/2010	18.19.41	Tethys	Occ.	R.	-11.7	-17.2
27/01/2010	2.08.09	Tethys	Ec.	D.	46.4	-48.2	08/02/2010	9.14.36	Tethys	Tr.	I.	-10.2	25.5	20/02/2010	22.27.34	Dione	Sh.	I.	32.8	-56.2
27/01/2010	5.26.43	Tethys	Occ.	R.	37.9	-12.0	08/02/2010	10.10.56	Rhea	Occ.	R.	-20.3	30.5	20/02/2010	23.05.49	Dione	Tr.	I.	38.4	-58.4
27/01/2010	7.09.44	Dione	Sh.	I.	21.6	5.9	08/02/2010	11.30.20	Tethys	Sh.	E.	-33.2	33.1	21/02/2010	1.35.47	Dione	Sh.	E.	48.9	-47.7
27/01/2010	8.12.16	Dione	Tr.	I.	10.4	15.1	08/02/2010	11.53.38	Tethys	Tr.	E.	-36.5	32.7	21/02/2010	1.59.50	Dione	Tr.	E.	48.2	-44.0
27/01/2010	10.21.08	Dione	Sh.	E.	-13.6	27.8	08/02/2010	14.52.57	Dione	Ec.	D.	-46.6	15.9	21/02/2010	13.51.08	Tethys	Sh.	I.	-46.6	27.9
27/01/2010	10.57.19	Dione	Tr.	E.	-20.1	29.3	08/02/2010	18.34.20	Dione	Occ.	R.	-18.1	-22.5	21/02/2010	14.16.13	Tethys	Tr.	I.	-45.4	24.6
27/01/2010	22.49.50	Rhea	Sh.	I.	19.7	-65.2	09/02/2010	7.19.10	Tethys	Ec.	D.	10.6	9.9	21/02/2010	16.40.53	Tethys	Sh.	E.	-28.1	1.5
28/01/2010	0.46.33	Rhea	Tr.	I.	38.3	-60.6	09/02/2010	10.32.40	Tethys	Occ.	R.	-24.7	32.1	21/02/2010	16.58.29	Tethys	Tr.	E.	-25.2	-1.2
28/01/2010	0.47.30	Tethys	Sh.	I.	38.4	-60.5	09/02/2010	23.39.28	Dione	Sh.	I.	36.5	-62.3	21/02/2010	19.24.03	Rhea	Ec.	D.	1.4	-28.8
28/01/2010	1.28.55	Tethys	Tr.	I.	43.3	-54.6	10/02/2010	0.29.55	Dione	Tr.	I.	42.9	-59.2	21/02/2010	23.22.14	Rhea	Occ.	R.	41.1	-58.3
28/01/2010	2.23.26	Rhea	Sh.	E.	47.5	-45.4	10/02/2010	2.49.10	Dione	Sh.	E.	47.8	-38.5	22/02/2010	7.23.02	Dione	Ec.	D.	0.5	14.0
28/01/2010	3.08.35	Rhea	Tr.	E.	48.4	-37.2	10/02/2010	3.19.25	Dione	Tr.	E.	45.9	-33.0	22/02/2010	10.54.48	Dione	Occ.	R.	-36.1	37.4
28/01/2010	3.38.40	Tethys	Sh.	E.	47.7	-31.7	10/02/2010	5.58.32	Tethys	Sh.	I.	24.3	-3.5	22/02/2010	12.30.31	Tethys	Ec.	D.	-45.7	35.8
28/01/2010	4.05.41	Tethys	Tr.	E.	46.1	-26.7	10/02/2010	6.32.04	Tethys	Tr.	I.	18.4	2.4	22/02/2010	15.37.27	Tethys	Occ.	R.	-36.8	12.5
28/01/2010	16.05.11	Dione	Ec.	D.	-45.2	2.2	10/02/2010	8.48.58	Tethys	Sh.	E.	-7.0	23.1	23/02/2010	11.09.55	Tethys	Sh.	I.	-38.6	38.1
28/01/2010	19.52.42	Dione	Occ.	R.	-12.2	-39.2	10/02/2010	9.11.32	Tethys	Tr.	E.	-11.1	25.7	23/02/2010	11.33.29	Tethys	Tr.	I.	-41.3	38.2
28/01/2010	23.26.51	Tethys	Ec.	D.	26.8	-66.0	10/02/2010	12.13.31	Rhea	Sh.	I.	-40.1	32.7	23/02/2010	13.59.34	Tethys	Sh.	E.	-45.8	27.4
29/01/2010	2.44.47	Tethys	Occ.	R.	48.3	-41.4	10/02/2010	13.46.16	Rhea	Tr.	I.	-47.0	25.2	23/02/2010	14.16.15	Tethys	Tr.	E.	-44.8	25.2
29/01/2010	22.06.12	Tethys	Sh.	I.	13.4	-60.5	10/02/2010	15.42.55	Rhea	Sh.	E.	-42.3	8.7	23/02/2010	16.09.38	Dione	Sh.	I.	-31.6	7.3
29/01/2010	22.46.38	Tethys	Tr.	I.	20.6	-64.4	10/02/2010	16.22.08	Rhea	Tr.	E.	-37.7	2.3	23/02/2010	16.44.34	Dione	Tr.	I.	-26.1	1.3
30/01/2010	0.51.39	Dione	Sh.	I.	40.0	-59.5	11/02/2010	4.37.54	Tethys	Ec.	D.	36.4	-18.3	23/02/2010	19.17.28	Dione	Sh.	E.	1.7	-27.2
30/01/2010	0.57.16	Tethys	Sh.	E.	40.7	-58.8	11/02/2010	7.50.33	Tethys	Occ.	R.	3.4	15.3	23/02/2010	19.39.46	Dione	Tr.	E.	5.7	-31.2
30/01/2010	1.23.44	Tethys	Tr.	E.	43.7	-55.0	11/02/2010	8.34.56	Dione	Ec.	D.	-5.1	21.6	24/02/2010	1.37.44	Rhea	Sh.	I.	48.7	-46.5
30/01/2010	1.52.05	Dione	Tr.	I.	46.1	-50.5	11/02/2010	12.14.34	Dione	Occ.	R.	-40.6	33.0	24/02/2010	2.40.41	Rhea	Tr.	I.	44.5	-36.4
30/01/2010	4.02.43	Dione	Sh.	E.	45.8	-27.0	12/02/2010	3.17.17	Tethys	Sh.	I.	45.4	-33.0	24/02/2010	5.02.33	Rhea	Sh.	E.	24.2	-10.6
30/01/2010	4.37.53	Dione	Tr.	E.	42.4	-20.4	12/02/2010	3.49.30	Tethys	Tr.	I.	42.2	-27.1	24/02/2010	5.32.56	Rhea	Tr.	E.	18.9	-4.9
30/01/2010	5.04.05	Rhea	Ec.	D.	39.3	-15.6	12/02/2010	6.07.36	Tethys	Sh.	E.	21.3	-0.9	24/02/2010	9.49.19	Tethys	Ec.	D.	-27.5	34.1
30/01/2010	9.21.53	Rhea	Occ.	R.	-4.8	23.9	12/02/2010	6.29.25	Tethys	Tr.	E.	17.4	2.4	24/02/2010	12.55.12	Tethys	Occ.	R.	-46.8	34.7
30/01/2010	20.45.33	Tethys	Ec.	D.	-0.3	-48.1	12/02/2010	17.21.28	Dione	Sh.	I.	-27.7	-8.2	25/02/2010	1.05.06	Dione	Ec.	D.	49.1	-50.5
31/01/2010	0.02.50	Tethys	Occ.	R.	33.8	-64.2	12/02/2010	18.09.03	Dione	Tr.	I.	-19.6	-17.0	25/02/2010	4.34.42	Dione	Occ.	R.	28.2	-15.5
31/01/2010	9.47.06	Dione	Ec.	D.	-10.3	26.5	12/02/2010	18.27.53	Rhea	Ec.	D.	-16.3	-20.4	25/02/2010	8.28.43	Tethys	Sh.	I.	-14.3	25.0
31/01/2010	13.33.13	Dione	Occ.	R.	-44.2	23.8	12/02/2010	20.30.48	Dione	Sh.	E.	6.5	-42.7	25/02/2010	8.50.44	Tethys	Tr.	I.	-18.3	27.9
31/01/2010	19.24.55	Tethys	Sh.	I.	-15.0	-33.5	12/02/2010	20.59.37	Dione	Tr.	E.	11.8	-47.4	25/02/2010	11.18.16	Tethys	Sh.	E.	-40.5	39.0
31/01/2010	20.04.19	Tethys	Tr.	I.	-7.9	-40.7	12/02/2010	22.35.02	Rhea	Occ.	R.	28.5	-59.4	25/02/2010	11.33.59	Tethys	Tr.	E.	-42.1	39.0
31/01/2010	22.15.52	Tethys	Sh.	E.	16.6	-61.1	13/02/2010	1.56.39	Tethys	Ec.	D.	48.8	-46.7	26/02/2010	7.08.07	Tethys	Ec.	D.	0.3	12.7
31/01/2010	22.41.46	Tethys	Tr.	E.	21.2	-63.5	13/02/2010	5.08.25	Tethys	Occ.	R.	30.6	-12.3	26/02/2010	7.52.14	Rhea	Ec.	D.	-8.5	19.9
01/02/2010	11.17.40	Rhea	Sh.	I.	-26.9	30.9	14/02/2010	0.36.02	Tethys	Sh.	I.	45.2	-57.4	26/02/2010	9.51.44	Dione	Sh.	I.	-29.2	35.0
01/02/2010	13.07.13	Rhea	Tr.	I.	-42.1	26.5	14/02/2010	1.06.54	Tethys	Tr.	I.	47.4	-53.8	26/02/2010	10.12.55	Tethys	Occ.	R.	-32.4	36.7
01/02/2010	14.49.55	Rhea	Sh.	E.	-47.5	14.6	14/02/2010	2.16.56	Dione	Ec.	D.	48.5	-43.2	26/02/2010	10.23.15	Dione	Tr.	I.	-33.9	37.4
01/02/2010	15.33.21	Rhea	Tr.	E.	-46.1	8.1	14/02/2010	3.26.15	Tethys	Sh.	E.	43.8	-30.9	26/02/2010	11.45.20	Rhea	Occ.	R.	-43.5	39.2
01/02/2010	18.04.16	Tethys	Ec.	D.	-28.2	-18.4	14/02/2010	3.47.16	Tethys	Tr.	E.	41.5	-27.0	26/02/2010	12.59.10	Dione	Sh.	E.	-46.9	35.0
01/02/2010	18.33.35	Dione	Sh.	I.	-23.3	-23.8	14/02/2010	5.54.43	Dione	Occ.	R.	22.2	-3.2	26/02/2010	13.19.40	Dione	Tr.	E.	-46.7	33.0
01/02/2010	19.31.45	Dione	Tr.	I.	-13.1	-34.6	14/02/2010	23.15.25	Tethys	Ec.	D.	36.1	-60.7	27/02/2010	5.47.32	Tethys	Sh.	I.	14.1	-0.7
01/02/2010	21.20.51	Tethys	Occ.	R.	7.3	-53.4	15/02/2010	0.41.31	Rhea	Sh.	I.	46.0	-56.5	27/02/2010	6.07.58	Tethys	Tr.	I.	10.3	2.6
01/02/2010	21.44.19	Dione	Sh.	E.	11.6	-56.9	15/02/2010	2.04.51	Rhea	Tr.	I.	48.7	-44.9	27/02/2010	8.36.57	Tethys	Sh.	E.	-17.3	26.8
01/02/2010	22.18.23	Dione	Tr.	E.	17.8	-61.1	15/02/2010	2.26.16	Tethys	Occ.	R.	48.0	-41.3	27/02/2010	8.51.42	Tethys	Tr.	E.	-19.8	28.7
02/02/2010	16.43.37	Tethys	Sh.	I.	-39.2	-3.3	15/02/2010	4.09.26	Rhea	Sh.	E.	38.2	-22.7	27/02/2010	18.47.12	Dione	Ec.	D.	-0.4	-20.8
02/02/2010	17.21.57	Tethys	Tr.	I.	-34.1	-10.5	15/02/2010	4.46.03	Rhea	Tr.	E.	32.9	-15.9	27/02/2010	22.14.33	Dione	Occ.	R.	35.4	-52.8
02/02/2010	19.34.28	Tethys	Sh.	E.	-11.8	-34.9	15/02/2010	11.03.29	Dione	Sh.	I.	-33.4	35.1	28/02/2010	4.26.56	Tethys	Ec.	D.	27.5	-16.1
02/02/2010	19.59.46	Tethys	Tr.	E.	-7.2	-39.4	15/02/2010	11.48.04	Dione	Tr.	I.	-39.4	35.2	28/02/2010	7.30.38	Tethys	Occ.	R.	-5.9	17.0
03/02/2010	3.29.02	Dione	Ec.	D.	47.0	-32.6	15/02/2010	14.12.27	Dione	Sh.	E.	-46.8	23.4	28/02/2010	14.05.57	Rhea	Sh.	I.	-43.9	28.0
03/02/2010	7.13.40	Dione	Occ.	R.	16.0	7.7	15/02/2010	14.39.45	Dione	Tr.	E.	-45.6	19.7	28/02/2010	14.58.08	Rhea	Tr.	I.	-38.5	20.4
03/02/2010	15.22.59	Tethys	Ec.	D.	-46.2	10.2	15/02/2010	21.54.48	Tethys	Sh.	I.	23.9	-54.4	28/02/2010	17.29.08	Rhea	Sh.	E.	-14.7	-6.1
03/02/2010	17.31.57	Rhea	Ec.	D.	-32.0	-12.1	15/02/2010	22.24.16	Tethys	Tr.	I.	28.9	-57.6	28/02/2010	17.55.51	Rhea	Tr.	E.	-9.8	-11.1
03/02/2010	18.38.51	Tethys	Occ.	R.	-21.0	-24.4	16/02/2010	0.44.54	Tethys	Sh.	E.	46.6	-55.8	01/03/2010	3.06.21	Tethys	Sh.	I.	39.2	-30.5
03/02/2010	21.46.33	Rhea	Occ.	R.	13.5</															

Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
04/03/2010	0.39.17	Dione	Tr.	E.	49.3	-50.8	16/03/2010	9.45.44	Rhea	Ec.	D.	-38.5	41.3	29/03/2010	10.43.16	Tethys	Tr.	I.	-45.9	50.7
04/03/2010	2.06.01	Tethys	Occ.	R.	44.8	-39.6	16/03/2010	13.14.40	Rhea	Occ.	R.	-42.0	39.3	29/03/2010	10.49.43	Tethys	Sh.	I.	-45.9	51.0
04/03/2010	21.44.00	Tethys	Sh.	I.	34.1	-48.0	17/03/2010	4.16.39	Tethys	Ec.	D.	17.2	-12.8	29/03/2010	13.34.07	Tethys	Tr.	E.	-32.6	40.8
04/03/2010	21.59.35	Tethys	Tr.	I.	36.4	-49.7	17/03/2010	7.09.33	Tethys	Occ.	R.	-14.8	19.0	29/03/2010	13.37.15	Tethys	Sh.	E.	-32.2	40.4
05/03/2010	0.33.05	Tethys	Sh.	E.	49.3	-51.0	17/03/2010	13.46.57	Dione	Sh.	I.	-38.0	35.6	29/03/2010	21.21.09	Dione	Occ.	D.	45.4	-37.4
05/03/2010	0.44.47	Tethys	Tr.	E.	49.3	-49.9	17/03/2010	13.53.06	Dione	Tr.	I.	-37.2	34.7	29/03/2010	22.51.17	Rhea	Occ.	D.	50.1	-44.0
05/03/2010	2.34.14	Rhea	Sh.	I.	41.3	-34.7	17/03/2010	16.51.30	Dione	Sh.	E.	-8.2	4.7	30/03/2010	0.34.38	Dione	Ec.	R.	43.7	-41.1
05/03/2010	3.15.24	Rhea	Tr.	I.	35.6	-27.6	17/03/2010	16.57.37	Dione	Tr.	E.	-7.0	3.6	30/03/2010	2.23.22	Rhea	Ec.	R.	27.8	-27.8
05/03/2010	5.55.44	Rhea	Sh.	E.	8.1	2.2	18/03/2010	2.56.07	Tethys	Sh.	I.	30.4	-26.7	30/03/2010	9.21.54	Tethys	Occ.	D.	-41.8	44.0
05/03/2010	6.11.27	Dione	Ec.	D.	5.2	4.9	18/03/2010	2.59.51	Tethys	Tr.	I.	29.8	-26.1	30/03/2010	12.16.44	Tethys	Ec.	R.	-41.5	49.6
05/03/2010	6.18.28	Rhea	Tr.	E.	3.9	6.1	18/03/2010	5.44.22	Tethys	Sh.	E.	0.6	4.0	31/03/2010	6.06.16	Dione	Tr.	I.	-13.7	12.1
05/03/2010	9.34.05	Dione	Occ.	R.	-30.8	35.9	18/03/2010	5.48.18	Tethys	Tr.	E.	0.0	4.7	31/03/2010	6.18.30	Dione	Sh.	I.	-15.9	14.4
05/03/2010	20.23.25	Tethys	Ec.	D.	21.4	-36.2	18/03/2010	15.59.33	Rhea	Sh.	I.	-16.7	14.3	31/03/2010	8.00.34	Tethys	Tr.	I.	-32.5	32.4
05/03/2010	23.23.42	Tethys	Occ.	R.	46.6	-53.8	18/03/2010	16.06.57	Rhea	Tr.	I.	-15.4	13.0	31/03/2010	8.08.41	Tethys	Sh.	I.	-33.7	33.7
06/03/2010	14.58.07	Dione	Sh.	I.	-35.0	21.9	18/03/2010	19.15.42	Rhea	Sh.	E.	19.4	-21.6	31/03/2010	9.15.34	Dione	Tr.	E.	-41.6	43.6
06/03/2010	15.19.01	Dione	Tr.	I.	-32.0	18.5	18/03/2010	19.24.41	Rhea	Tr.	E.	21.0	-23.2	31/03/2010	9.20.46	Dione	Sh.	E.	-42.1	44.3
06/03/2010	18.04.21	Dione	Sh.	E.	-3.0	-11.4	18/03/2010	22.42.27	Dione	Ec.	D.	48.0	-47.9	31/03/2010	10.51.46	Tethys	Tr.	E.	-45.8	51.8
06/03/2010	18.19.01	Dione	Tr.	E.	-0.1	-14.1	19/03/2010	1.35.34	Tethys	Ec.	D.	41.6	-38.7	31/03/2010	10.56.05	Tethys	Sh.	E.	-45.8	52.0
06/03/2010	19.02.51	Tethys	Sh.	I.	7.6	-22.1	19/03/2010	1.52.16	Dione	Occ.	R.	39.4	-36.4	01/04/2010	4.59.53	Rhea	Tr.	I.	-1.5	0.5
06/03/2010	19.16.46	Tethys	Tr.	I.	10.1	-24.6	19/03/2010	4.27.11	Tethys	Occ.	R.	13.8	-10.2	01/04/2010	5.25.34	Rhea	Sh.	I.	-7.1	5.0
06/03/2010	21.51.49	Tethys	Sh.	E.	36.5	-48.2	20/03/2010	0.15.01	Tethys	Sh.	I.	48.6	-46.5	01/04/2010	6.39.13	Tethys	Occ.	D.	-20.2	18.5
06/03/2010	22.02.27	Tethys	Tr.	E.	38.0	-49.3	20/03/2010	0.17.03	Tethys	Tr.	I.	48.5	-46.3	01/04/2010	8.29.23	Rhea	Tr.	E.	-37.0	37.4
07/03/2010	8.48.50	Rhea	Ec.	D.	-24.9	31.2	20/03/2010	3.03.10	Tethys	Sh.	E.	27.9	-24.8	01/04/2010	8.35.54	Rhea	Sh.	E.	-37.8	38.4
07/03/2010	12.30.34	Rhea	Occ.	R.	-46.6	40.4	20/03/2010	3.05.55	Tethys	Tr.	E.	27.5	-24.4	01/04/2010	9.35.35	Tethys	Ec.	R.	-43.6	46.4
07/03/2010	17.42.16	Tethys	Ec.	D.	-6.8	-7.1	20/03/2010	7.29.13	Dione	Sh.	I.	-20.4	23.4	01/04/2010	14.59.54	Dione	Occ.	D.	-16.5	28.0
07/03/2010	20.41.21	Tethys	Occ.	R.	26.0	-38.5	20/03/2010	7.31.39	Dione	Tr.	I.	-20.8	23.8	01/04/2010	18.16.31	Dione	Ec.	R.	19.7	-8.1
07/03/2010	23.53.36	Dione	Ec.	D.	48.9	-52.4	20/03/2010	10.33.19	Dione	Sh.	E.	-44.4	46.6	02/04/2010	5.17.53	Tethys	Tr.	I.	-6.4	3.9
08/03/2010	3.13.47	Dione	Occ.	R.	34.1	-27.0	20/03/2010	10.37.12	Dione	Tr.	E.	-44.6	46.8	02/04/2010	5.27.39	Tethys	Sh.	I.	-8.2	5.6
08/03/2010	16.21.42	Tethys	Sh.	I.	-20.5	8.1	20/03/2010	22.14.18	Rhea	Ec.	D.	46.6	-45.4	02/04/2010	8.09.26	Tethys	Tr.	E.	-34.9	34.5
08/03/2010	16.33.56	Tethys	Tr.	I.	-18.3	6.0	20/03/2010	22.54.28	Tethys	Ec.	D.	49.1	-47.6	02/04/2010	8.14.56	Tethys	Sh.	E.	-35.6	35.4
08/03/2010	19.10.33	Tethys	Sh.	E.	10.6	-23.0	21/03/2010	1.36.24	Rhea	Occ.	R.	40.5	-37.8	02/04/2010	23.45.04	Dione	Tr.	I.	47.0	-42.4
08/03/2010	19.20.07	Tethys	Tr.	E.	12.3	-24.7	21/03/2010	1.44.49	Tethys	Occ.	R.	39.4	-36.7	03/04/2010	0.00.52	Dione	Sh.	I.	45.6	-41.7
09/03/2010	8.40.18	Dione	Sh.	I.	-24.8	30.7	21/03/2010	16.24.43	Dione	Ec.	D.	-9.9	10.4	03/04/2010	2.55.11	Dione	Tr.	E.	19.3	-21.4
09/03/2010	8.57.33	Dione	Tr.	I.	-27.6	33.1	21/03/2010	19.31.51	Dione	Occ.	R.	24.5	-23.7	03/04/2010	3.02.41	Dione	Sh.	E.	18.0	-20.2
09/03/2010	11.46.07	Dione	Sh.	E.	-46.0	43.3	21/03/2010	21.33.57	Tethys	Sh.	I.	42.9	-41.4	03/04/2010	3.56.33	Tethys	Occ.	D.	8.1	-10.9
09/03/2010	11.58.43	Dione	Tr.	E.	-46.4	42.9	21/03/2010	21.34.15	Tethys	Tr.	I.	43.0	-41.4	03/04/2010	6.54.26	Tethys	Ec.	R.	-24.1	21.9
09/03/2010	15.01.08	Tethys	Ec.	D.	-32.7	22.2	22/03/2010	0.21.58	Tethys	Sh.	E.	47.7	-45.2	03/04/2010	11.09.22	Rhea	Occ.	D.	-44.9	53.4
09/03/2010	15.02.36	Rhea	Sh.	I.	-32.5	22.0	22/03/2010	0.23.33	Tethys	Tr.	E.	47.6	-45.1	03/04/2010	14.50.08	Rhea	Ec.	R.	-16.7	30.1
09/03/2010	15.32.34	Rhea	Tr.	I.	-27.9	17.0	22/03/2010	20.12.51	Tethys	Occ.	D.	32.1	-30.1	04/04/2010	2.35.15	Tethys	Tr.	I.	22.2	-24.2
09/03/2010	17.59.01	Tethys	Occ.	R.	-1.3	-9.8	22/03/2010	23.02.27	Tethys	Occ.	R.	49.7	-47.0	04/04/2010	2.46.39	Tethys	Sh.	I.	20.1	-22.4
09/03/2010	18.22.22	Rhea	Sh.	E.	2.6	-14.1	23/03/2010	1.10.14	Dione	Tr.	I.	42.8	-40.3	04/04/2010	5.27.07	Tethys	Tr.	E.	-9.6	6.1
09/03/2010	18.40.48	Rhea	Tr.	E.	5.9	-17.4	23/03/2010	1.11.30	Dione	Sh.	I.	42.6	-40.1	04/04/2010	5.33.48	Tethys	Sh.	E.	-10.8	7.4
10/03/2010	13.40.34	Tethys	Sh.	I.	-42.1	34.3	23/03/2010	4.15.09	Dione	Sh.	E.	13.0	-11.2	04/04/2010	8.38.43	Dione	Occ.	D.	-39.5	39.8
10/03/2010	13.51.07	Tethys	Tr.	I.	-41.1	33.0	23/03/2010	4.16.48	Dione	Tr.	E.	12.7	-10.9	04/04/2010	11.58.25	Dione	Ec.	R.	-41.1	52.5
10/03/2010	16.29.18	Tethys	Sh.	E.	-17.6	7.2	23/03/2010	4.24.20	Rhea	Tr.	I.	11.3	-9.5	05/04/2010	1.13.55	Tethys	Occ.	D.	35.0	-34.9
10/03/2010	16.37.45	Tethys	Tr.	E.	-16.1	5.7	23/03/2010	4.28.08	Rhea	Sh.	I.	10.6	-8.8	05/04/2010	4.13.18	Tethys	Ec.	R.	3.6	-7.3
10/03/2010	17.35.47	Dione	Ec.	D.	-5.5	-5.2	23/03/2010	7.42.25	Rhea	Sh.	E.	-24.7	26.6	05/04/2010	17.18.10	Rhea	Tr.	I.	12.2	3.7
10/03/2010	20.53.27	Dione	Occ.	R.	30.2	-39.5	23/03/2010	7.46.21	Rhea	Tr.	E.	-25.3	27.3	05/04/2010	17.23.57	Dione	Tr.	I.	13.3	2.7
11/03/2010	12.20.00	Tethys	Ec.	D.	-46.4	42.5	23/03/2010	18.51.29	Tethys	Tr.	I.	18.9	-16.3	05/04/2010	17.43.16	Dione	Sh.	I.	16.8	-0.4
11/03/2010	15.16.39	Tethys	Occ.	R.	-29.1	20.2	23/03/2010	18.52.52	Tethys	Sh.	I.	19.2	-16.5	05/04/2010	17.54.24	Rhea	Sh.	I.	18.8	-2.7
11/03/2010	21.17.14	Rhea	Ec.	D.	34.6	-42.5	23/03/2010	21.40.46	Tethys	Sh.	E.	44.7	-41.5	05/04/2010	20.34.50	Dione	Tr.	E.	43.8	-29.6
12/03/2010	0.52.44	Rhea	Occ.	R.	48.2	-46.4	23/03/2010	21.41.11	Tethys	Tr.	E.	44.7	-41.5	05/04/2010	20.44.36	Dione	Sh.	E.	44.9	-30.9
12/03/2010	2.22.30	Dione	Sh.	I.	39.2	-34.3	24/03/2010	10.03.52	Dione	Occ.	D.	-43.4	46.2	05/04/2010	20.50.52	Rhea	Tr.	E.	45.5	-31.7
12/03/2010	2.36.04	Dione	Tr.	I.	37.3	-32.1	24/03/2010	13.11.24	Dione	Occ.	R.	-38.5	42.2	05/04/2010	21.02.41	Rhea	Sh.	E.	46.7	-33.1
12/03/2010	5.27.54	Dione	Sh.	E.	7.9	-0.5	24/03/2010	17.30.05	Tethys	Occ.	D.	4.9	-0.5	05/04/2010	23.52.37	Tethys	Tr.	I.	45.2	-40.9
12/03/2010	5.38.22	Dione	Tr.	E.	6.0	1.2	24/03/2010	20.20.15	Tethys	Ec.	R.	34.6	-30.8	06/04/2010	0.05.38	Tethys	Sh.	I.	43.8	-40.3
12/03/2010	10.59.26	Tethys	Sh.	I.	-44.1	44.5	25/03/2010	10.33.32	Rhea	Occ.	D.	-45.3	48.6	06/04/2010	2.44.49	Tethys	Tr.	E.	19.0	-22.0
12/03/2010	11.08.18	Tethys	Tr.	I.	-44.7	44.6	25/03/2010	13.58.00	Rhea	Occ.	R.	-31.7	36.3	06/04/2010	2.52.40	Tethys	Sh.	E.	17.6	-20.8
12/03/2010	13.48.03	Tethys	Sh.	E.	-40.4	34.0	25/03/2010	16.08.43	Tethys	Tr.	I.	-9.6	14.2	06/04/2010	22.31.19	Tethys	Occ.	D.	50.2	-40.4
12/03/2010	13.55.24	Tethys	Tr.	E.	-39.6	33.0	25/03/2010	16.11.49	Tethys	Sh.	I.	-9.1	13.6	07/04/2010	1.32.10	Tethys	Ec.	R.	30.9	-32.0
13/03/2010	9.38.52	Tethys	Ec.	D.	-36.1	39.5	25/03/2010	18.48.51	Dione	Tr.	I.	20.0	-15.3	07/04/2010	2.17.36	Dione	Occ.	D.	23.1	-25.9
13/03/2010	11.17.59	Dione	Ec.	D.	-45.5	45.1	25/03/2010	18.53.49	Dione	Sh.	I.	20.9	-16.2	07/04/2010	5.40.20	Dione	Ec.	R.	-14.2	9.5
13/03/2010	12.34.18	Tethys	Occ.	R.	-45.7	42.2	25/03/2010	18.59.49	Tethys	Tr.	E.	21.8	-17.1	07/04/2010	21.10.02	Tethys	Tr.	I.	48.0	-33.4
13/03/2010	14.33.05	Dione	Occ.	R.	-34.2															

Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
10/04/2010	17.06.12	Tethys	Occ.	D.	13.9	6.8	23/04/2010	2.25.00	Tethys	Tr.	E.	9.9	-19.6	05/05/2010	1.29.18	Rhea	Occ.	D.	11.2	-23.4
10/04/2010	20.09.57	Tethys	Ec.	R.	43.5	-24.7	23/04/2010	2.42.50	Tethys	Sh.	E.	6.7	-17.0	05/05/2010	5.56.40	Tethys	Occ.	D.	-34.8	19.6
11/04/2010	4.41.58	Dione	Tr.	I.	-6.6	0.3	23/04/2010	12.13.04	Dione	Occ.	D.	-28.6	57.6	05/05/2010	5.57.56	Rhea	Ec.	R.	-35.0	19.9
11/04/2010	5.08.07	Dione	Sh.	I.	-11.3	4.8	23/04/2010	12.13.47	Titan	Occ.	D.	-28.4	57.5	05/05/2010	9.16.10	Tethys	Ec.	R.	-43.1	54.8
11/04/2010	7.54.15	Dione	Tr.	E.	-37.5	34.9	23/04/2010	15.30.48	Titan	Occ.	R.	6.6	26.9	05/05/2010	19.38.35	Dione	Tr.	I.	50.1	-14.2
11/04/2010	8.08.29	Dione	Sh.	E.	-39.2	37.3	23/04/2010	15.52.08	Dione	Ec.	R.	10.5	22.9	05/05/2010	20.30.58	Dione	Sh.	I.	50.8	-21.2
11/04/2010	15.44.57	Tethys	Tr.	I.	0.1	22.0	23/04/2010	18.35.55	Rhea	Tr.	I.	38.5	-6.8	05/05/2010	22.54.48	Dione	Tr.	E.	37.2	-31.5
11/04/2010	16.02.40	Tethys	Sh.	I.	3.1	18.7	23/04/2010	19.50.33	Rhea	Sh.	I.	47.4	-18.7	05/05/2010	23.26.36	Dione	Sh.	E.	32.2	-31.4
11/04/2010	18.38.01	Tethys	Tr.	E.	30.8	-9.7	23/04/2010	22.09.25	Tethys	Occ.	D.	48.2	-33.5	06/05/2010	4.35.41	Tethys	Tr.	I.	-23.3	5.2
11/04/2010	18.49.19	Tethys	Sh.	E.	32.7	-11.7	23/04/2010	22.17.58	Rhea	Tr.	E.	47.5	-34.0	06/05/2010	5.10.40	Tethys	Sh.	I.	-28.9	11.4
12/04/2010	11.46.43	Rhea	Occ.	D.	-38.6	55.9	23/04/2010	22.49.57	Rhea	Sh.	E.	44.2	-35.1	06/05/2010	7.31.11	Tethys	Tr.	E.	-44.0	37.3
12/04/2010	13.35.40	Dione	Occ.	D.	-22.9	44.3	24/04/2010	1.22.23	Tethys	Ec.	R.	20.6	-27.4	06/05/2010	7.55.35	Tethys	Sh.	E.	-44.9	41.7
12/04/2010	14.23.41	Tethys	Occ.	D.	-14.6	36.6	24/04/2010	20.48.18	Tethys	Tr.	I.	50.7	-26.1	07/05/2010	3.14.42	Tethys	Occ.	D.	-9.9	-8.5
12/04/2010	15.43.44	Rhea	Ec.	R.	0.6	22.4	24/04/2010	20.58.51	Dione	Tr.	I.	50.8	-27.3	07/05/2010	4.32.37	Dione	Occ.	D.	-23.5	4.9
12/04/2010	17.04.13	Dione	Ec.	R.	15.1	7.6	24/04/2010	21.16.03	Tethys	Sh.	I.	50.6	-29.0	07/05/2010	6.35.09	Tethys	Ec.	R.	-40.2	27.1
12/04/2010	17.28.50	Tethys	Ec.	R.	19.6	3.2	24/04/2010	21.40.38	Dione	Sh.	I.	49.8	-31.2	07/05/2010	7.40.08	Rhea	Tr.	I.	-44.5	39.1
13/04/2010	13.02.27	Tethys	Tr.	I.	-27.5	49.2	24/04/2010	23.42.56	Tethys	Tr.	E.	36.6	-34.4	07/05/2010	8.22.18	Dione	Ec.	R.	-44.9	46.6
13/04/2010	13.21.42	Tethys	Sh.	I.	-24.4	46.6	25/04/2010	0.01.47	Tethys	Sh.	E.	33.7	-33.7	07/05/2010	9.18.28	Rhea	Sh.	I.	-42.4	55.6
13/04/2010	15.55.47	Tethys	Tr.	E.	3.4	20.4	25/04/2010	0.13.45	Dione	Tr.	E.	31.7	-33.0	07/05/2010	11.26.02	Rhea	Tr.	E.	-26.7	64.6
13/04/2010	16.08.13	Tethys	Sh.	E.	5.7	18.1	25/04/2010	0.38.26	Dione	Sh.	E.	27.6	-31.3	07/05/2010	12.10.28	Rhea	Sh.	E.	-19.4	61.6
13/04/2010	22.21.07	Dione	Tr.	I.	49.8	-37.4	25/04/2010	19.27.11	Tethys	Occ.	D.	46.0	-14.7	08/05/2010	1.53.44	Tethys	Tr.	I.	4.5	-19.8
13/04/2010	22.50.35	Dione	Sh.	I.	48.0	-38.5	25/04/2010	22.41.20	Tethys	Ec.	R.	44.3	-34.2	08/05/2010	2.29.48	Tethys	Sh.	I.	-1.6	-15.0
14/04/2010	1.34.01	Dione	Tr.	E.	25.7	-29.3	26/04/2010	0.46.32	Rhea	Occ.	D.	25.5	-30.3	08/05/2010	4.49.21	Tethys	Tr.	E.	-26.8	8.0
14/04/2010	1.50.27	Dione	Sh.	E.	22.9	-27.3	26/04/2010	5.04.14	Rhea	Ec.	R.	-21.3	8.1	08/05/2010	5.14.34	Tethys	Sh.	E.	-30.7	12.5
14/04/2010	11.41.13	Tethys	Occ.	D.	-38.2	56.9	26/04/2010	5.52.43	Dione	Occ.	D.	-29.1	16.9	08/05/2010	13.18.51	Dione	Tr.	I.	-6.5	52.7
14/04/2010	14.47.45	Tethys	Ec.	R.	-8.7	32.9	26/04/2010	9.34.09	Dione	Ec.	R.	-44.3	54.8	08/05/2010	14.13.36	Dione	Sh.	I.	3.9	43.5
14/04/2010	17.56.02	Rhea	Tr.	I.	25.9	-0.9	26/04/2010	18.06.05	Tethys	Tr.	I.	35.9	-0.4	08/05/2010	16.35.18	Dione	Tr.	E.	29.4	17.5
14/04/2010	18.52.19	Rhea	Sh.	I.	35.2	-11.5	26/04/2010	18.35.08	Tethys	Sh.	I.	40.2	-6.1	08/05/2010	17.08.40	Dione	Sh.	E.	34.8	11.5
14/04/2010	21.34.04	Rhea	Tr.	E.	50.5	-33.7	26/04/2010	21.00.54	Tethys	Tr.	E.	50.8	-26.9	09/05/2010	0.32.46	Tethys	Occ.	D.	18.6	-27.6
14/04/2010	21.56.17	Rhea	Sh.	E.	50.4	-35.5	26/04/2010	21.20.44	Tethys	Sh.	E.	50.3	-28.9	09/05/2010	3.54.08	Tethys	Ec.	R.	-18.3	-0.8
15/04/2010	7.14.51	Dione	Occ.	D.	-34.6	29.2	27/04/2010	14.38.36	Dione	Tr.	I.	0.4	37.1	09/05/2010	9.40.56	Titan	Occ.	D.	-39.6	59.1
15/04/2010	10.20.00	Tethys	Tr.	I.	-44.6	55.8	27/04/2010	15.23.11	Dione	Sh.	I.	8.3	29.0	09/05/2010	13.51.37	Rhea	Occ.	D.	0.8	47.5
15/04/2010	10.40.44	Tethys	Sh.	I.	-43.4	57.1	27/04/2010	16.44.59	Tethys	Occ.	D.	23.1	13.9	09/05/2010	13.57.38	Titan	Occ.	R.	1.8	46.5
15/04/2010	10.46.11	Dione	Ec.	R.	-43.0	57.3	27/04/2010	17.53.53	Dione	Tr.	E.	34.7	1.7	09/05/2010	18.24.46	Rhea	Ec.	R.	45.6	-1.0
15/04/2010	11.09.43	Titan	Tr.	I.	-41.0	57.8	27/04/2010	18.20.27	Dione	Sh.	E.	38.7	-2.9	09/05/2010	22.12.56	Dione	Occ.	D.	40.9	-29.1
15/04/2010	13.13.35	Tethys	Tr.	E.	-24.4	48.3	27/04/2010	20.00.17	Tethys	Ec.	R.	49.4	-19.1	09/05/2010	23.11.50	Tethys	Tr.	I.	32.0	-30.5
15/04/2010	13.27.08	Tethys	Sh.	E.	-22.1	46.3	28/04/2010	6.56.43	Rhea	Tr.	I.	-38.7	29.3	09/05/2010	23.48.56	Tethys	Sh.	I.	25.7	-29.8
15/04/2010	13.51.41	Titan	Tr.	E.	-17.9	42.6	28/04/2010	8.19.47	Rhea	Sh.	I.	-44.8	44.1	10/05/2010	2.04.22	Dione	Ec.	R.	1.3	-18.0
16/04/2010	8.58.47	Tethys	Occ.	D.	-44.6	46.9	28/04/2010	10.40.19	Rhea	Tr.	E.	-38.2	61.5	10/05/2010	2.07.33	Tethys	Tr.	E.	0.7	-17.6
16/04/2010	12.06.39	Tethys	Ec.	R.	-33.9	56.0	28/04/2010	11.16.47	Rhea	Sh.	E.	-33.7	62.2	10/05/2010	2.33.34	Tethys	Sh.	E.	-4.5	-14.0
16/04/2010	16.00.23	Dione	Tr.	I.	6.6	20.1	28/04/2010	15.23.55	Tethys	Tr.	I.	9.2	29.0	10/05/2010	21.50.54	Tethys	Occ.	D.	43.2	-27.6
16/04/2010	16.33.04	Dione	Sh.	I.	12.6	14.1	28/04/2010	15.54.14	Tethys	Sh.	I.	14.8	23.4	11/05/2010	1.13.08	Tethys	Ec.	R.	9.8	-23.7
16/04/2010	19.13.51	Dione	Tr.	E.	39.6	-14.6	28/04/2010	18.18.53	Tethys	Tr.	E.	39.1	-2.3	11/05/2010	6.59.15	Dione	Tr.	I.	-43.3	32.3
16/04/2010	19.32.25	Dione	Sh.	E.	42.1	-17.6	28/04/2010	18.39.41	Tethys	Sh.	E.	41.9	-6.4	11/05/2010	7.56.14	Dione	Sh.	I.	-45.0	42.7
17/04/2010	0.06.07	Rhea	Occ.	D.	37.9	-36.2	28/04/2010	23.32.29	Dione	Occ.	D.	35.7	-33.4	11/05/2010	10.15.54	Dione	Tr.	E.	-34.5	63.4
17/04/2010	4.10.34	Rhea	Ec.	R.	-5.2	-3.9	29/04/2010	3.16.10	Dione	Ec.	R.	-4.1	-10.2	11/05/2010	10.50.44	Dione	Sh.	E.	-29.6	65.6
17/04/2010	7.37.35	Tethys	Tr.	I.	-38.4	33.8	29/04/2010	14.02.50	Tethys	Occ.	D.	-5.2	43.7	11/05/2010	20.02.47	Rhea	Tr.	I.	51.0	-16.3
17/04/2010	7.59.47	Tethys	Sh.	I.	-40.7	37.7	29/04/2010	17.19.15	Tethys	Ec.	R.	30.5	8.0	11/05/2010	20.29.59	Tethys	Tr.	I.	50.1	-19.8
17/04/2010	10.31.24	Tethys	Tr.	E.	-43.4	57.3	30/04/2010	8.18.27	Dione	Tr.	I.	-44.9	44.3	11/05/2010	21.08.04	Tethys	Sh.	I.	47.4	-23.9
17/04/2010	10.46.03	Tethys	Sh.	E.	-42.3	58.0	30/04/2010	9.05.46	Dione	Sh.	I.	-44.7	52.0	11/05/2010	21.47.55	Rhea	Sh.	I.	43.1	-27.2
18/04/2010	0.54.08	Dione	Occ.	D.	29.7	-32.3	30/04/2010	11.34.06	Dione	Tr.	E.	-30.0	62.3	11/05/2010	23.25.47	Tethys	Tr.	E.	28.3	-29.8
18/04/2010	4.28.09	Dione	Ec.	R.	-9.3	-0.1	30/04/2010	12.02.30	Dione	Sh.	E.	-25.6	60.5	11/05/2010	23.49.29	Rhea	Tr.	E.	24.2	-29.2
18/04/2010	6.16.23	Tethys	Occ.	D.	-27.8	19.3	30/04/2010	12.41.48	Tethys	Tr.	I.	-19.0	56.3	11/05/2010	23.52.34	Tethys	Sh.	E.	23.7	-29.1
18/04/2010	9.25.35	Tethys	Ec.	R.	-45.4	51.2	30/04/2010	13.07.37	Rhea	Occ.	D.	-14.5	52.8	12/05/2010	0.37.18	Rhea	Sh.	E.	15.6	-26.6
19/04/2010	4.55.12	Tethys	Tr.	I.	-14.9	4.7	30/04/2010	13.13.20	Tethys	Sh.	I.	-13.5	51.9	12/05/2010	15.53.23	Dione	Occ.	D.	25.0	25.9
19/04/2010	5.18.50	Tethys	Sh.	I.	-19.0	8.9	30/04/2010	15.36.55	Tethys	Tr.	E.	13.1	27.0	12/05/2010	19.09.04	Tethys	Occ.	D.	50.1	-8.4
19/04/2010	6.15.42	Rhea	Tr.	I.	-28.3	19.4	30/04/2010	15.58.39	Tethys	Sh.	E.	17.1	23.0	12/05/2010	19.46.26	Dione	Ec.	R.	51.1	-13.9
19/04/2010	7.21.24	Rhea	Sh.	I.	-37.4	31.5	30/04/2010	17.31.05	Rhea	Ec.	R.	33.1	6.1	12/05/2010	22.32.08	Tethys	Ec.	R.	36.4	-29.2
19/04/2010	7.49.14	Tethys	Tr.	E.	-40.5	36.4	01/05/2010	8.25.08	Titan	Tr.	I.	-45.1	45.7	13/05/2010	17.48.11	Tethys	Tr.	I.	43.3	5.3
19/04/2010	8.04.58	Tethys	Sh.	E.	-41.9	39.1	01/05/2010	11.20.44	Tethys	Occ.	D.	-31.3	63.0	13/05/2010	18.27.13	Tethys	Sh.	I.	47.5	-0.7
19/04/2010	9.39.45	Dione	Tr.	I.	-45.2	53.3	01/05/2010	12.22.23	Titan	Tr.	E.	-21.6	58.9	13/05/2010	20.44.04	Tethys	Tr.	E.	48.7	-21.0
19/04/2010	9.55.54	Rhea	Tr.	E.	-44.8	55.1	01/05/2010	14.38.13	Tethys	Ec.	R.	3.1	37.9	13/05/2010	21.11.34	Tethys	Sh.	E.	46.3	-23.8
19/04/2010	10.15.34	Dione	Sh.	I.	-43.8	56.9	01/05/2010	17.12.24	Dione	Occ.	D.	30.7	9.6	14/05/2010	0.39.48	Dione	Tr.	I.	13.7	-25.9
19/04/2010	10.23.07	Rhea	Sh.	E																



Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
16/05/2010	21.37.26	Dione	Tr.	E.	41.9	-25.3	29/05/2010	1.59.08	Dione	Occ.	D.	-12.1	-15.4	10/06/2010	9.32.02	Rhea	Ec.	R.	-23.3	61.9
16/05/2010	22.14.54	Dione	Sh.	E.	36.5	-27.6	29/05/2010	5.58.57	Dione	Ec.	R.	-43.9	23.3	10/06/2010	9.33.09	Dione	Tr.	I.	-23.1	62.1
17/05/2010	6.22.44	Titan	Tr.	I.	-42.5	26.4	29/05/2010	18.54.47	Tethys	Occ.	D.	51.0	-3.0	10/06/2010	10.46.06	Dione	Sh.	I.	-10.4	70.3
17/05/2010	10.48.36	Titan	Tr.	E.	-26.2	67.0	29/05/2010	21.39.57	Rhea	Tr.	I.	33.9	-23.1	10/06/2010	11.06.45	Titan	Occ.	R.	-6.7	71.0
17/05/2010	12.24.43	Tethys	Tr.	I.	-9.7	62.2	29/05/2010	22.23.19	Tethys	Ec.	R.	26.7	-25.4	10/06/2010	12.49.54	Dione	Tr.	E.	12.6	62.1
17/05/2010	13.05.31	Tethys	Sh.	I.	-1.4	56.5	29/05/2010	23.46.26	Rhea	Sh.	I.	11.8	-25.7	10/06/2010	13.33.51	Dione	Sh.	E.	20.6	54.9
17/05/2010	15.20.44	Tethys	Tr.	E.	22.8	32.7	30/05/2010	1.27.46	Rhea	Tr.	E.	-7.2	-18.8	11/06/2010	1.26.51	Tethys	Tr.	I.	-15.5	-17.9
17/05/2010	15.49.35	Tethys	Sh.	E.	27.9	27.3	30/05/2010	2.24.27	Rhea	Sh.	E.	-17.3	-12.0	11/06/2010	2.14.51	Tethys	Sh.	I.	-23.7	-12.4
18/05/2010	3.14.43	Dione	Occ.	D.	-17.8	-6.4	30/05/2010	10.46.06	Dione	Tr.	I.	-18.0	69.2	11/06/2010	4.23.00	Tethys	Tr.	E.	-40.8	6.9
18/05/2010	7.10.35	Dione	Ec.	R.	-44.8	35.5	30/05/2010	11.55.06	Dione	Sh.	I.	-5.6	67.7	11/06/2010	4.57.00	Tethys	Sh.	E.	-43.4	12.7
18/05/2010	11.03.52	Tethys	Occ.	D.	-23.1	67.6	30/05/2010	14.03.14	Dione	Tr.	E.	18.2	48.6	11/06/2010	18.27.53	Dione	Occ.	D.	50.0	2.5
18/05/2010	14.29.10	Tethys	Ec.	R.	14.2	42.3	30/05/2010	14.45.25	Dione	Sh.	E.	25.7	40.9	11/06/2010	22.29.27	Dione	Ec.	R.	16.5	-24.2
18/05/2010	14.38.12	Rhea	Occ.	D.	15.9	40.7	30/05/2010	17.34.06	Tethys	Tr.	I.	48.8	10.2	12/06/2010	0.06.19	Tethys	Occ.	D.	-0.8	-23.7
18/05/2010	19.18.24	Rhea	Ec.	R.	51.1	-8.8	30/05/2010	18.19.42	Tethys	Sh.	I.	50.9	2.6	12/06/2010	3.36.36	Tethys	Ec.	R.	-36.2	-0.1
19/05/2010	9.43.03	Tethys	Tr.	I.	-34.6	61.4	30/05/2010	20.30.21	Tethys	Tr.	E.	43.3	-16.4	12/06/2010	10.59.48	Rhea	Tr.	I.	-6.5	71.0
19/05/2010	10.24.40	Tethys	Sh.	I.	-28.6	65.9	30/05/2010	21.02.46	Tethys	Sh.	E.	39.0	-19.8	12/06/2010	13.16.02	Rhea	Sh.	I.	18.8	58.1
19/05/2010	12.01.19	Dione	Tr.	I.	-12.4	65.2	31/05/2010	16.13.26	Tethys	Occ.	D.	40.3	24.7	12/06/2010	14.46.22	Rhea	Tr.	E.	34.3	42.0
19/05/2010	12.39.08	Tethys	Tr.	E.	-5.5	60.7	31/05/2010	19.40.36	Dione	Occ.	D.	48.1	-9.9	12/06/2010	15.44.27	Rhea	Sh.	E.	42.6	31.2
19/05/2010	13.04.15	Dione	Sh.	I.	-0.2	57.0	31/05/2010	19.42.21	Tethys	Ec.	R.	48.0	-10.2	12/06/2010	22.45.48	Tethys	Tr.	I.	12.8	-24.6
19/05/2010	13.08.36	Tethys	Sh.	E.	0.4	56.3	31/05/2010	23.41.03	Dione	Ec.	R.	11.3	-25.6	12/06/2010	23.34.03	Tethys	Sh.	I.	4.0	-24.6
19/05/2010	15.18.22	Dione	Tr.	E.	23.8	33.4	01/06/2010	3.53.04	Rhea	Occ.	D.	-32.7	1.7	13/06/2010	1.41.54	Tethys	Tr.	E.	-19.5	-16.2
19/05/2010	15.57.00	Dione	Sh.	E.	30.5	26.2	01/06/2010	8.38.42	Rhea	Ec.	R.	-36.2	52.7	13/06/2010	2.16.02	Tethys	Sh.	E.	-25.1	-12.2
20/05/2010	8.22.14	Tethys	Occ.	D.	-42.5	48.7	01/06/2010	14.52.47	Tethys	Tr.	I.	28.3	39.8	13/06/2010	3.15.16	Dione	Tr.	I.	-34.0	-3.8
20/05/2010	11.48.11	Tethys	Ec.	R.	-14.1	66.5	01/06/2010	15.38.53	Tethys	Sh.	I.	35.9	31.2	13/06/2010	4.28.52	Dione	Sh.	I.	-42.0	7.9
20/05/2010	20.50.02	Rhea	Tr.	I.	45.6	-20.2	01/06/2010	17.49.02	Tethys	Tr.	E.	50.2	7.9	13/06/2010	6.31.51	Dione	Tr.	E.	-43.7	29.8
20/05/2010	20.55.36	Dione	Occ.	D.	45.0	-20.8	01/06/2010	18.21.48	Tethys	Sh.	E.	51.1	2.5	13/06/2010	7.15.58	Dione	Sh.	E.	-40.3	38.0
20/05/2010	22.47.03	Rhea	Sh.	I.	28.8	-27.7	02/06/2010	4.27.39	Dione	Tr.	I.	-37.6	7.4	13/06/2010	21.25.17	Tethys	Occ.	D.	26.6	-20.3
21/05/2010	0.37.42	Rhea	Tr.	E.	8.9	-24.6	02/06/2010	4.55.40	Titan	Tr.	I.	-40.5	12.2	14/06/2010	0.55.38	Tethys	Ec.	R.	-12.0	-20.5
21/05/2010	0.52.40	Dione	Ec.	R.	6.2	-23.4	02/06/2010	5.37.50	Dione	Sh.	I.	-43.7	19.7	14/06/2010	12.10.04	Dione	Occ.	D.	8.1	67.7
21/05/2010	1.30.55	Rhea	Sh.	E.	-0.4	-19.7	02/06/2010	7.44.44	Dione	Tr.	E.	-41.5	43.1	14/06/2010	16.11.33	Dione	Ec.	R.	46.5	26.4
21/05/2010	7.01.27	Tethys	Tr.	I.	-44.8	34.1	02/06/2010	8.27.31	Dione	Sh.	E.	-37.1	50.8	14/06/2010	17.13.57	Rhea	Occ.	D.	50.6	15.1
21/05/2010	7.43.50	Tethys	Sh.	I.	-44.4	41.9	02/06/2010	9.23.57	Titan	Tr.	E.	-29.4	60.3	14/06/2010	20.04.48	Tethys	Tr.	I.	38.8	-11.7
21/05/2010	9.57.34	Tethys	Tr.	E.	-31.5	63.6	02/06/2010	13.32.07	Tethys	Occ.	D.	14.7	54.4	14/06/2010	20.53.15	Tethys	Sh.	I.	31.3	-17.3
21/05/2010	10.27.37	Tethys	Sh.	E.	-26.9	66.6	02/06/2010	17.01.23	Tethys	Ec.	R.	47.0	16.3	14/06/2010	21.58.37	Rhea	Ec.	R.	20.0	-22.6
22/05/2010	5.40.39	Tethys	Occ.	D.	-40.7	19.3	03/06/2010	10.05.54	Rhea	Tr.	I.	-22.2	66.2	14/06/2010	23.00.51	Tethys	Tr.	E.	8.6	-24.7
22/05/2010	5.42.18	Dione	Tr.	I.	-40.8	19.6	03/06/2010	12.11.30	Tethys	Tr.	I.	0.8	66.5	14/06/2010	23.35.05	Tethys	Sh.	E.	2.4	-24.5
22/05/2010	6.46.56	Dione	Sh.	I.	-44.6	31.5	03/06/2010	12.16.14	Rhea	Sh.	I.	1.6	66.0	15/06/2010	18.44.18	Tethys	Occ.	D.	47.8	0.4
22/05/2010	8.59.25	Dione	Tr.	E.	-38.4	55.3	03/06/2010	12.58.05	Tethys	Sh.	I.	9.1	60.1	15/06/2010	20.57.32	Dione	Tr.	I.	30.0	-17.6
22/05/2010	9.07.12	Tethys	Ec.	R.	-37.5	56.5	03/06/2010	13.22.12	Dione	Occ.	D.	13.6	56.2	15/06/2010	22.11.38	Dione	Sh.	I.	16.9	-23.2
22/05/2010	9.39.06	Dione	Sh.	E.	-33.5	61.3	03/06/2010	13.53.30	Rhea	Tr.	E.	19.3	50.8	15/06/2010	22.14.41	Tethys	Ec.	R.	16.4	-23.3
23/05/2010	3.02.30	Rhea	Occ.	D.	-19.1	-7.5	03/06/2010	14.51.10	Rhea	Sh.	E.	29.4	40.3	16/06/2010	0.13.54	Dione	Tr.	E.	-5.8	-23.2
23/05/2010	4.19.53	Tethys	Tr.	I.	-31.4	5.2	03/06/2010	15.07.45	Tethys	Tr.	E.	32.1	37.2	16/06/2010	0.58.04	Dione	Sh.	E.	-13.8	-20.3
23/05/2010	5.03.00	Tethys	Sh.	I.	-37.1	12.6	03/06/2010	15.40.50	Tethys	Sh.	E.	37.3	31.1	16/06/2010	17.23.50	Tethys	Tr.	I.	50.9	13.5
23/05/2010	7.16.03	Tethys	Tr.	E.	-44.8	37.0	03/06/2010	17.23.09	Dione	Ec.	R.	49.1	12.5	16/06/2010	18.12.26	Tethys	Sh.	I.	49.8	5.3
23/05/2010	7.45.12	Rhea	Ec.	R.	-44.0	42.4	04/06/2010	10.50.52	Tethys	Occ.	D.	-13.7	70.0	16/06/2010	20.19.50	Tethys	Tr.	E.	35.4	-13.5
23/05/2010	7.46.38	Tethys	Sh.	E.	-43.9	42.7	04/06/2010	14.20.26	Tethys	Ec.	R.	24.8	46.0	16/06/2010	20.54.08	Tethys	Sh.	E.	29.9	-17.3
23/05/2010	14.36.38	Dione	Occ.	D.	19.2	41.6	04/06/2010	22.09.20	Dione	Tr.	I.	25.0	-24.0	16/06/2010	23.27.45	Rhea	Tr.	I.	2.3	-24.6
23/05/2010	18.34.46	Dione	Ec.	R.	50.6	-0.4	04/06/2010	23.20.35	Dione	Sh.	I.	12.2	-25.5	17/06/2010	1.46.01	Rhea	Sh.	I.	-22.8	-15.7
24/05/2010	2.59.07	Tethys	Occ.	D.	-19.2	-7.9	05/06/2010	1.26.21	Dione	Tr.	E.	-11.2	-18.3	17/06/2010	3.13.28	Rhea	Tr.	E.	-35.8	-4.1
24/05/2010	6.26.14	Tethys	Ec.	R.	-44.2	27.9	05/06/2010	2.09.38	Dione	Sh.	E.	-18.8	-13.4	17/06/2010	4.11.01	Rhea	Sh.	E.	-41.9	5.0
24/05/2010	23.23.25	Dione	Tr.	I.	19.6	-27.1	05/06/2010	9.30.16	Tethys	Tr.	I.	-26.7	61.5	17/06/2010	5.52.23	Dione	Occ.	D.	-44.7	22.5
25/05/2010	0.29.39	Dione	Sh.	I.	7.5	-24.4	05/06/2010	10.17.16	Tethys	Sh.	I.	-18.9	67.6	17/06/2010	9.53.38	Dione	Ec.	R.	-15.0	65.1
25/05/2010	1.38.22	Tethys	Tr.	I.	-5.4	-18.3	05/06/2010	12.26.30	Tethys	Tr.	E.	4.8	64.9	17/06/2010	16.03.22	Tethys	Occ.	D.	46.8	28.0
25/05/2010	2.22.10	Tethys	Sh.	I.	-13.4	-12.9	05/06/2010	12.59.52	Tethys	Sh.	E.	10.9	60.1	17/06/2010	19.33.43	Tethys	Ec.	R.	41.5	-7.4
25/05/2010	2.40.34	Dione	Tr.	E.	-16.7	-10.4	05/06/2010	16.19.22	Rhea	Occ.	D.	43.6	24.2	18/06/2010	4.04.11	Titan	Tr.	I.	-41.6	3.9
25/05/2010	3.21.12	Dione	Sh.	E.	-23.5	-4.2	05/06/2010	21.05.23	Rhea	Ec.	R.	35.0	-19.3	18/06/2010	8.09.49	Titan	Tr.	E.	-31.4	47.8
25/05/2010	4.34.34	Tethys	Tr.	E.	-34.5	7.9	06/06/2010	7.03.57	Dione	Occ.	D.	-43.3	35.7	18/06/2010	14.39.56	Dione	Tr.	I.	36.8	43.5
25/05/2010	5.05.40	Tethys	Sh.	E.	-38.3	13.3	06/06/2010	8.09.40	Tethys	Occ.	D.	-37.4	47.8	18/06/2010	14.42.55	Tethys	Tr.	I.	37.2	43.0
25/05/2010	7.52.23	Titan	Occ.	D.	-43.2	43.9	06/06/2010	11.05.15	Dione	Ec.	R.	-9.8	70.6	18/06/2010	15.31.38	Tethys	Sh.	I.	43.8	34.0
25/05/2010	9.14.40	Rhea	Tr.	I.	-35.1	58.1	06/06/2010	11.39.28	Tethys	Ec.	R.	-3.0	69.8	18/06/2010	15.54.25	Dione	Sh.	I.	46.3	29.7
25/05/2010	11.16.42	Rhea	Sh.	I.	-16.1	68.9	07/06/2010	6.49.05	Tethys	Tr.	I.	-43.9	33.0	18/06/2010	17.38.51	Tethys	Tr.	E.	50.7	11.0
25/05/2010	12.26.46	Titan	Occ.	R.	-3.0	63.4	07/06/2010	7.36.27	Tethys	Sh.	I.	-40.5	41.7	18/06/2010	17.56.02	Dione	Tr.	E.	50.2	8.1
25/05/2010	13.02.30	Rhea	Tr.	E.	3.5	58.2	07/06/2010	9.45.17	Tethys	Tr.	E.	-23.0	63.8	18/06/2010	18.13.10	Tethys	Sh.	E.	49.2	5.3
25/05/2010	13.57.42	Rhea	Sh.	E.	13.															

Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
22/06/2010	9.21.14	Tethys	Tr.	I.	-17.4	60.1	04/07/2010	15.56.51	Tethys	Occ.	D.	50.2	29.6	16/07/2010	22.34.09	Tethys	Tr.	I.	-9.4	-26.0
22/06/2010	10.10.02	Tethys	Sh.	I.	-8.7	67.2	04/07/2010	19.25.04	Tethys	Ec.	R.	33.0	-6.1	16/07/2010	23.19.34	Tethys	Sh.	I.	-17.5	-26.8
22/06/2010	12.17.00	Tethys	Tr.	E.	14.9	67.3	05/07/2010	0.57.11	Dione	Tr.	I.	-26.2	-21.2	17/07/2010	1.27.52	Tethys	Tr.	E.	-37.2	-20.1
22/06/2010	12.51.15	Tethys	Sh.	E.	21.1	62.6	05/07/2010	1.26.09	Rhea	Tr.	I.	-30.7	-18.7	17/07/2010	1.58.39	Tethys	Sh.	E.	-40.7	-16.8
22/06/2010	17.17.27	Dione	Occ.	D.	50.8	14.9	05/07/2010	2.11.10	Dione	Sh.	I.	-36.8	-13.7	17/07/2010	8.46.48	Dione	Occ.	D.	-7.3	52.1
22/06/2010	21.17.49	Dione	Ec.	R.	21.7	-19.3	05/07/2010	3.46.43	Rhea	Sh.	I.	-44.8	0.4	17/07/2010	12.36.15	Dione	Ec.	R.	33.9	63.5
23/06/2010	8.00.49	Tethys	Occ.	D.	-30.0	46.0	05/07/2010	4.10.52	Dione	Tr.	E.	-45.4	4.0	17/07/2010	21.14.00	Tethys	Occ.	D.	5.0	-20.7
23/06/2010	11.30.51	Tethys	Ec.	R.	7.1	71.1	05/07/2010	4.52.40	Dione	Sh.	E.	-44.8	10.9	18/07/2010	0.38.13	Tethys	Occ.	R.	-31.0	-24.3
23/06/2010	18.11.12	Rhea	Occ.	D.	47.9	5.8	05/07/2010	5.05.40	Rhea	Tr.	E.	-44.2	13.2	18/07/2010	15.01.48	Rhea	Tr.	I.	49.7	39.0
23/06/2010	22.51.37	Rhea	Ec.	R.	3.9	-24.4	05/07/2010	5.56.31	Rhea	Sh.	E.	-40.3	22.3	18/07/2010	17.18.05	Rhea	Sh.	I.	43.3	13.9
24/06/2010	2.05.09	Dione	Tr.	I.	-30.1	-13.7	05/07/2010	14.36.36	Tethys	Tr.	I.	44.5	44.4	18/07/2010	17.35.07	Dione	Tr.	I.	41.2	10.9
24/06/2010	3.20.00	Dione	Sh.	I.	-39.7	-3.1	05/07/2010	15.24.26	Tethys	Sh.	I.	48.8	35.5	18/07/2010	18.32.52	Rhea	Tr.	E.	32.8	1.4
24/06/2010	5.20.38	Dione	Tr.	E.	-45.0	16.6	05/07/2010	17.31.30	Tethys	Tr.	E.	47.2	12.4	18/07/2010	18.45.09	Dione	Sh.	I.	30.8	-0.4
24/06/2010	6.04.22	Dione	Sh.	E.	-42.9	24.5	05/07/2010	18.04.31	Tethys	Sh.	E.	43.8	6.8	18/07/2010	19.14.36	Rhea	Sh.	E.	25.9	-5.7
24/06/2010	6.40.26	Tethys	Tr.	I.	-39.8	31.1	06/07/2010	9.52.27	Dione	Occ.	D.	-1.7	63.9	18/07/2010	19.53.52	Tethys	Tr.	I.	19.0	-11.4
24/06/2010	7.29.14	Tethys	Sh.	I.	-33.9	40.1	06/07/2010	13.16.20	Tethys	Occ.	D.	34.0	58.5	18/07/2010	20.38.45	Tethys	Sh.	I.	10.8	-17.1
24/06/2010	9.36.07	Tethys	Tr.	E.	-13.5	62.4	06/07/2010	13.48.09	Dione	Ec.	R.	38.8	53.1	18/07/2010	20.45.19	Dione	Tr.	E.	9.6	-17.9
24/06/2010	10.10.18	Tethys	Sh.	E.	-7.3	67.1	06/07/2010	16.44.06	Tethys	Ec.	R.	49.9	20.8	18/07/2010	21.22.52	Dione	Sh.	E.	2.7	-21.7
25/06/2010	5.20.04	Tethys	Occ.	D.	-44.9	16.4	07/07/2010	7.42.00	Rhea	Occ.	D.	-24.9	41.5	18/07/2010	22.47.21	Tethys	Tr.	E.	-13.1	-26.7
25/06/2010	8.49.54	Tethys	Ec.	R.	-20.9	54.7	07/07/2010	11.56.06	Tethys	Tr.	I.	21.1	68.9	18/07/2010	23.17.39	Tethys	Sh.	E.	-18.5	-27.1
25/06/2010	11.00.11	Dione	Occ.	D.	2.9	71.1	07/07/2010	12.10.29	Rhea	Ec.	R.	23.6	67.6	19/07/2010	18.33.44	Tethys	Occ.	D.	32.1	1.1
25/06/2010	14.59.54	Dione	Ec.	R.	43.1	40.1	07/07/2010	12.43.37	Tethys	Sh.	I.	29.3	63.5	19/07/2010	21.57.14	Tethys	Ec.	R.	-4.5	-24.6
26/06/2010	0.25.38	Rhea	Tr.	I.	-15.0	-22.6	07/07/2010	14.50.50	Tethys	Tr.	E.	46.7	41.7	20/07/2010	2.30.42	Dione	Occ.	D.	-44.3	-13.2
26/06/2010	2.46.13	Rhea	Sh.	I.	-36.8	-8.5	07/07/2010	15.23.33	Tethys	Sh.	E.	49.2	35.7	20/07/2010	6.18.15	Dione	Ec.	R.	-30.8	24.6
26/06/2010	3.59.42	Tethys	Tr.	I.	-43.6	2.9	07/07/2010	18.40.31	Dione	Tr.	I.	38.1	1.1	20/07/2010	17.13.37	Tethys	Tr.	I.	42.9	14.5
26/06/2010	4.08.52	Rhea	Tr.	E.	-44.1	4.3	07/07/2010	19.53.58	Dione	Sh.	I.	26.3	-10.3	20/07/2010	17.57.55	Tethys	Sh.	I.	37.0	6.8
26/06/2010	4.48.26	Tethys	Sh.	I.	-45.2	10.9	07/07/2010	21.53.38	Dione	Tr.	E.	4.7	-22.7	20/07/2010	20.06.51	Tethys	Tr.	E.	15.2	-13.5
26/06/2010	5.03.56	Rhea	Sh.	I.	-45.2	13.5	07/07/2010	22.34.44	Dione	Sh.	E.	-2.6	-24.8	20/07/2010	20.36.40	Tethys	Sh.	E.	9.8	-17.2
26/06/2010	6.20.54	Titan	Occ.	D.	-41.0	27.4	08/07/2010	10.35.51	Tethys	Occ.	D.	7.1	68.6	20/07/2010	21.18.43	Rhea	Occ.	D.	2.2	-21.6
26/06/2010	6.55.16	Tethys	Tr.	E.	-37.3	33.7	08/07/2010	14.03.08	Tethys	Ec.	R.	41.8	50.4	21/07/2010	1.28.21	Rhea	Ec.	R.	-39.1	-20.7
26/06/2010	7.29.20	Tethys	Sh.	E.	-32.9	40.0	09/07/2010	3.35.51	Dione	Occ.	D.	-45.1	-1.5	21/07/2010	11.19.05	Dione	Tr.	I.	23.3	68.4
26/06/2010	9.52.50	Titan	Occ.	R.	-9.2	64.7	09/07/2010	7.30.11	Dione	Ec.	R.	-25.7	39.2	21/07/2010	12.27.56	Dione	Sh.	I.	34.8	63.9
26/06/2010	19.47.58	Dione	Tr.	I.	34.3	-9.1	09/07/2010	9.15.38	Tethys	Tr.	I.	-7.3	57.9	21/07/2010	14.28.23	Dione	Tr.	E.	48.5	44.8
26/06/2010	21.02.47	Dione	Sh.	I.	21.7	-17.9	09/07/2010	10.02.49	Tethys	Sh.	I.	1.8	64.9	21/07/2010	15.04.52	Dione	Sh.	E.	50.0	38.1
26/06/2010	23.03.04	Dione	Tr.	E.	0.0	-24.6	09/07/2010	12.10.12	Tethys	Tr.	E.	24.8	67.4	21/07/2010	15.53.30	Tethys	Occ.	D.	49.3	29.1
26/06/2010	23.46.27	Dione	Sh.	E.	-8.6	-24.3	09/07/2010	12.42.34	Tethys	Sh.	E.	30.3	63.5	21/07/2010	19.16.14	Tethys	Ec.	R.	23.6	-6.3
27/06/2010	2.39.20	Tethys	Occ.	D.	-36.4	-9.5	09/07/2010	13.57.22	Rhea	Tr.	I.	41.5	51.3	22/07/2010	14.33.24	Tethys	Tr.	I.	49.0	43.7
27/06/2010	6.08.56	Tethys	Ec.	R.	-41.7	25.1	09/07/2010	16.17.05	Rhea	Sh.	I.	50.3	25.7	22/07/2010	15.17.06	Tethys	Sh.	I.	50.0	35.7
28/06/2010	1.19.00	Tethys	Tr.	I.	-25.3	-18.8	09/07/2010	17.34.31	Rhea	Tr.	E.	45.4	11.8	22/07/2010	17.26.22	Tethys	Tr.	E.	40.3	12.0
28/06/2010	2.07.38	Tethys	Sh.	I.	-32.7	-13.6	09/07/2010	18.22.40	Rhea	Sh.	E.	39.5	3.7	22/07/2010	17.55.40	Tethys	Sh.	E.	36.2	6.9
28/06/2010	4.14.27	Tethys	Tr.	E.	-44.7	5.1	10/07/2010	7.55.24	Tethys	Occ.	D.	-20.9	43.7	22/07/2010	20.14.43	Dione	Occ.	D.	12.4	-14.8
28/06/2010	4.43.03	Dione	Occ.	D.	-45.3	9.8	10/07/2010	11.22.09	Tethys	Ec.	R.	16.9	70.2	23/07/2010	0.00.14	Dione	Ec.	R.	-28.1	-27.2
28/06/2010	4.48.23	Tethys	Sh.	E.	-45.3	10.7	10/07/2010	12.23.59	Dione	Tr.	I.	27.8	65.8	23/07/2010	3.35.00	Rhea	Tr.	I.	-45.7	-4.2
28/06/2010	6.40.48	Rhea	Occ.	D.	-38.2	30.9	10/07/2010	13.36.46	Dione	Sh.	I.	39.2	54.9	23/07/2010	5.48.44	Rhea	Sh.	I.	-33.6	18.8
28/06/2010	8.41.58	Dione	Ec.	R.	-20.4	53.1	10/07/2010	15.36.27	Dione	Tr.	E.	50.1	33.1	23/07/2010	7.02.18	Rhea	Tr.	E.	-22.1	32.4
28/06/2010	11.18.00	Rhea	Ec.	R.	8.2	71.3	10/07/2010	16.16.47	Dione	Sh.	E.	50.2	25.7	23/07/2010	7.40.21	Rhea	Sh.	E.	-15.5	39.4
28/06/2010	23.58.39	Tethys	Occ.	D.	-12.2	-24.0	11/07/2010	6.35.12	Tethys	Tr.	I.	-33.0	28.8	23/07/2010	13.13.18	Tethys	Occ.	D.	42.0	57.3
29/06/2010	3.27.58	Tethys	Ec.	R.	-42.3	-1.9	11/07/2010	7.22.00	Tethys	Sh.	I.	-25.8	37.4	23/07/2010	16.35.14	Tethys	Ec.	R.	45.8	21.1
29/06/2010	13.30.54	Dione	Tr.	I.	32.3	56.2	11/07/2010	9.29.35	Tethys	Tr.	E.	-2.9	59.9	24/07/2010	5.03.09	Dione	Tr.	I.	-39.0	10.5
29/06/2010	14.45.35	Dione	Sh.	I.	43.1	42.8	11/07/2010	10.01.36	Tethys	Sh.	E.	2.9	64.5	24/07/2010	6.10.44	Dione	Sh.	I.	-29.9	22.7
29/06/2010	16.45.35	Dione	Tr.	E.	50.7	20.7	11/07/2010	20.13.35	Rhea	Occ.	D.	20.2	-13.2	24/07/2010	8.11.29	Dione	Tr.	E.	-9.3	44.9
29/06/2010	17.28.32	Dione	Sh.	E.	49.2	13.1	11/07/2010	21.19.23	Dione	Occ.	D.	8.2	-20.4	24/07/2010	8.46.51	Dione	Sh.	E.	-2.1	51.1
29/06/2010	22.38.20	Tethys	Tr.	I.	2.2	-24.3	12/07/2010	0.36.34	Rhea	Ec.	R.	-27.2	-23.5	24/07/2010	11.53.14	Tethys	Tr.	I.	30.9	66.7
29/06/2010	23.26.50	Tethys	Sh.	I.	-7.1	-24.8	12/07/2010	1.12.13	Dione	Ec.	R.	-32.6	-20.8	24/07/2010	12.36.16	Tethys	Sh.	I.	37.5	62.4
30/06/2010	1.33.40	Tethys	Tr.	E.	-28.9	-17.5	12/07/2010	5.15.00	Tethys	Occ.	D.	-41.9	14.1	24/07/2010	14.45.54	Tethys	Tr.	E.	49.7	41.2
30/06/2010	2.07.25	Tethys	Sh.	E.	-33.8	-13.7	12/07/2010	8.41.11	Tethys	Ec.	R.	-11.6	51.7	24/07/2010	15.14.40	Tethys	Sh.	E.	49.9	35.9
30/06/2010	12.55.34	Rhea	Tr.	I.	27.0	62.0	13/07/2010	3.54.49	Tethys	Tr.	I.	-45.7	0.7	25/07/2010	9.52.16	Rhea	Occ.	D.	10.2	61.1
30/06/2010	15.16.26	Rhea	Sh.	I.	46.8	37.1	13/07/2010	4.41.12	Tethys	Sh.	I.	-44.2	8.1	25/07/2010	10.33.09	Tethys	Occ.	D.	17.7	65.7
30/06/2010	16.37.06	Rhea	Tr.	E.	50.7	22.2	13/07/2010	6.07.34	Dione	Tr.	I.	-35.8	23.5	25/07/2010	13.54.01	Rhea	Ec.	R.	47.0	50.3
30/06/2010	17.30.16	Rhea	Sh.	E.	48.8	12.8	13/07/2010	6.48.59	Tethys	Tr.	E.	-29.9	31.1	25/07/2010	13.54.14	Tethys	Ec.	R.	47.0	50.3
30/06/2010	21.18.01	Tethys	Occ.	D.	16.1	-19.5	13/07/2010	7.19.33	Dione	Sh.	I.	-25.1	36.8	25/07/2010	13.58.52	Dione	Occ.	D.	47.4	49.5
30/06/2010	22.26.03	Dione	Occ.	D.	3.7	-23.9	13/07/2010	7.20.37	Tethys	Sh.	E.	-24.9	37.0	25/07/2010	17.42.13	Dione	Ec.	R.	36.5	8.8
01/07/2010	0.47.00	Tethys	Tr.	E.	-22.0	-21.6	13/07/2010	9.19.21	Dione	Tr.	E.	-3.7	58.1	26/07/2010	9.13.05	Tethys	Tr.	I.	3.7	55.2
01/07/2010	2.24.02	Dione	Ec.	R.	-36.5															

Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
29/07/2010	16.31.40	Dione	Tr.	I.	43.7	21.0	10/08/2010	14.42.21	Tethys	Tr.	E.	48.5	38.8	23/08/2010	17.14.19	Tethys	Tr.	I.	23.3	7.7
29/07/2010	17.36.18	Dione	Sh.	I.	35.1	9.3	10/08/2010	15.05.25	Tethys	Sh.	E.	47.2	34.7	23/08/2010	17.42.25	Tethys	Sh.	I.	18.4	2.7
29/07/2010	19.37.48	Dione	Tr.	E.	14.4	-10.9	11/08/2010	0.26.07	Dione	Occ.	D.	-41.3	-30.5	23/08/2010	19.46.43	Rhea	Tr.	I.	-4.6	-18.6
29/07/2010	20.10.48	Dione	Sh.	E.	8.3	-15.6	11/08/2010	3.53.45	Dione	Ec.	R.	-40.2	-4.5	23/08/2010	20.00.03	Tethys	Tr.	E.	-7.2	-20.6
29/07/2010	22.26.29	Rhea	Occ.	D.	-16.8	-28.3	11/08/2010	10.33.02	Tethys	Occ.	D.	27.8	61.6	23/08/2010	20.17.54	Tethys	Sh.	E.	-10.4	-23.1
30/07/2010	2.19.30	Rhea	Ec.	R.	-45.8	-16.5	11/08/2010	13.44.58	Tethys	Ec.	R.	49.1	48.5	23/08/2010	21.28.41	Rhea	Sh.	I.	-23.0	-31.5
30/07/2010	3.52.53	Tethys	Tr.	I.	-43.8	-1.9	12/08/2010	9.13.06	Tethys	Tr.	I.	14.4	52.0	23/08/2010	22.27.05	Rhea	Tr.	E.	-32.4	-35.7
30/07/2010	4.33.45	Tethys	Sh.	I.	-40.1	4.5	12/08/2010	9.14.54	Dione	Tr.	I.	14.7	52.3	23/08/2010	22.33.49	Rhea	Sh.	E.	-33.4	-36.0
30/07/2010	6.44.36	Tethys	Tr.	E.	-21.0	28.1	12/08/2010	9.47.45	Tethys	Sh.	I.	20.6	56.8	24/08/2010	15.54.27	Tethys	Occ.	D.	35.6	22.2
30/07/2010	7.11.37	Tethys	Sh.	E.	-16.3	33.1	12/08/2010	10.10.08	Dione	Sh.	I.	24.5	59.3	24/08/2010	17.11.50	Dione	Occ.	D.	23.1	7.9
31/07/2010	1.27.30	Dione	Occ.	D.	-43.0	-22.8	12/08/2010	12.02.00	Tethys	Tr.	E.	41.5	61.2	24/08/2010	18.57.25	Tethys	Ec.	R.	4.1	-11.0
31/07/2010	2.32.50	Tethys	Occ.	D.	-46.2	-14.9	12/08/2010	12.13.15	Rhea	Occ.	D.	42.8	60.3	24/08/2010	20.22.54	Dione	Ec.	R.	-12.0	-24.1
31/07/2010	5.06.07	Dione	Ec.	R.	-35.7	10.0	12/08/2010	12.14.01	Dione	Tr.	E.	42.9	60.3	25/08/2010	14.34.35	Tethys	Tr.	I.	44.8	36.3
31/07/2010	5.51.11	Tethys	Ec.	R.	-29.2	18.1	12/08/2010	12.24.21	Tethys	Sh.	E.	44.0	59.3	25/08/2010	15.01.31	Tethys	Sh.	I.	42.0	31.6
01/08/2010	1.12.49	Tethys	Tr.	I.	-42.0	-24.4	12/08/2010	12.40.24	Dione	Sh.	E.	45.5	57.5	25/08/2010	17.19.44	Tethys	Tr.	E.	21.1	6.2
01/08/2010	1.52.55	Tethys	Sh.	I.	-45.0	-20.2	12/08/2010	15.34.32	Rhea	Ec.	R.	43.9	28.9	25/08/2010	17.36.48	Tethys	Sh.	E.	18.0	3.2
01/08/2010	4.04.12	Tethys	Tr.	E.	-42.4	-0.4	13/08/2010	7.53.10	Tethys	Occ.	D.	0.6	38.5	26/08/2010	2.00.50	Dione	Tr.	I.	-45.9	-25.1
01/08/2010	4.30.36	Tethys	Sh.	E.	-39.7	3.7	13/08/2010	11.03.54	Tethys	Ec.	R.	33.9	62.5	26/08/2010	2.06.53	Rhea	Occ.	D.	-45.6	-24.3
01/08/2010	4.43.22	Rhea	Tr.	I.	-38.2	5.9	13/08/2010	18.11.03	Dione	Occ.	D.	19.9	0.5	26/08/2010	2.43.50	Dione	Sh.	I.	-42.5	-18.9
01/08/2010	6.50.27	Rhea	Sh.	I.	-18.8	28.9	13/08/2010	21.35.37	Dione	Ec.	R.	-17.7	-28.9	26/08/2010	4.46.01	Rhea	Ec.	R.	-25.6	2.2
01/08/2010	8.01.21	Rhea	Tr.	E.	-6.0	41.9	14/08/2010	6.33.15	Tethys	Tr.	I.	-14.0	23.7	26/08/2010	4.50.15	Dione	Tr.	E.	-24.9	2.9
01/08/2010	8.31.20	Rhea	Sh.	E.	0.1	47.2	14/08/2010	7.06.53	Tethys	Sh.	I.	-7.9	29.9	26/08/2010	5.09.35	Dione	Sh.	E.	-21.6	6.3
01/08/2010	10.16.05	Dione	Tr.	I.	19.0	62.6	14/08/2010	9.21.40	Tethys	Tr.	E.	17.2	52.8	26/08/2010	13.14.44	Tethys	Occ.	D.	48.6	48.8
01/08/2010	11.19.04	Dione	Sh.	I.	29.8	66.0	14/08/2010	9.43.18	Tethys	Sh.	E.	21.0	55.8	26/08/2010	16.16.19	Tethys	Ec.	R.	31.1	17.6
01/08/2010	13.21.00	Dione	Tr.	E.	46.1	54.5	14/08/2010	18.31.06	Rhea	Tr.	I.	15.6	-3.5	27/08/2010	10.57.18	Dione	Occ.	D.	39.4	57.8
01/08/2010	13.52.45	Dione	Sh.	E.	48.4	49.4	14/08/2010	20.24.24	Rhea	Sh.	I.	-5.4	-21.3	27/08/2010	11.54.53	Tethys	Tr.	I.	45.6	56.7
01/08/2010	23.52.48	Tethys	Occ.	D.	-32.7	-29.7	14/08/2010	21.29.31	Rhea	Tr.	E.	-17.3	-28.7	27/08/2010	12.20.36	Tethys	Sh.	I.	47.3	54.8
02/08/2010	3.10.10	Tethys	Ec.	R.	-45.7	-9.9	14/08/2010	21.46.00	Rhea	Sh.	E.	-20.2	-30.1	27/08/2010	14.04.41	Dione	Ec.	R.	46.5	40.8
02/08/2010	19.11.59	Dione	Occ.	D.	16.3	-7.8	15/08/2010	2.59.53	Dione	Tr.	I.	-44.1	-14.1	27/08/2010	14.39.24	Tethys	Tr.	E.	43.5	34.9
02/08/2010	22.32.48	Tethys	Tr.	I.	-20.5	-29.5	15/08/2010	3.52.53	Dione	Sh.	I.	-38.8	-5.4	27/08/2010	14.55.41	Tethys	Sh.	E.	41.8	32.0
02/08/2010	22.48.03	Dione	Ec.	R.	-23.1	-30.0	15/08/2010	5.13.19	Tethys	Occ.	D.	-27.1	8.9	28/08/2010	8.25.52	Rhea	Tr.	I.	15.6	41.2
02/08/2010	23.12.04	Tethys	Sh.	I.	-27.1	-30.4	15/08/2010	5.57.17	Dione	Tr.	E.	-19.7	16.9	28/08/2010	10.01.47	Rhea	Sh.	I.	32.0	54.1
03/08/2010	1.23.48	Tethys	Tr.	E.	-43.7	-23.8	15/08/2010	6.22.17	Dione	Sh.	E.	-15.3	21.5	28/08/2010	10.35.03	Tethys	Occ.	D.	36.9	56.6
03/08/2010	1.49.34	Tethys	Sh.	E.	-45.3	-21.0	15/08/2010	8.22.50	Tethys	Ec.	R.	7.1	43.3	28/08/2010	10.55.09	Rhea	Tr.	E.	39.6	57.4
03/08/2010	11.01.22	Rhea	Occ.	D.	28.0	65.2	16/08/2010	3.53.25	Tethys	Tr.	I.	-38.3	-5.6	28/08/2010	10.56.40	Rhea	Sh.	E.	39.8	57.5
03/08/2010	14.44.46	Rhea	Ec.	R.	49.5	39.8	16/08/2010	4.26.00	Tethys	Sh.	I.	-33.9	0.6	28/08/2010	13.35.12	Tethys	Ec.	R.	47.9	45.1
03/08/2010	21.12.48	Tethys	Occ.	D.	-6.9	-24.0	16/08/2010	6.41.20	Tethys	Tr.	E.	-11.3	24.9	28/08/2010	19.46.19	Dione	Tr.	I.	-8.0	-20.1
04/08/2010	0.29.08	Tethys	Ec.	R.	-38.6	-28.5	16/08/2010	7.02.14	Tethys	Sh.	E.	-7.5	28.8	28/08/2010	20.26.33	Dione	Sh.	I.	-15.3	-25.9
04/08/2010	4.00.38	Dione	Tr.	I.	-41.8	-1.4	16/08/2010	11.56.06	Dione	Occ.	D.	42.3	60.4	28/08/2010	22.33.26	Dione	Tr.	E.	-36.1	-37.7
04/08/2010	5.01.51	Dione	Sh.	I.	-34.5	8.6	16/08/2010	15.17.28	Dione	Ec.	R.	44.1	31.1	28/08/2010	22.51.22	Dione	Sh.	E.	-38.4	-38.3
04/08/2010	7.04.14	Dione	Tr.	E.	-14.5	31.0	17/08/2010	0.50.18	Rhea	Occ.	D.	-45.3	-30.4	29/08/2010	9.15.13	Tethys	Tr.	I.	24.9	48.3
04/08/2010	7.34.41	Dione	Sh.	E.	-9.0	36.6	17/08/2010	2.33.30	Tethys	Occ.	D.	-45.5	-18.4	29/08/2010	9.39.41	Tethys	Sh.	I.	29.0	51.4
04/08/2010	19.52.48	Tethys	Tr.	I.	7.5	-14.4	17/08/2010	3.58.54	Rhea	Ec.	R.	-37.2	-4.7	29/08/2010	11.59.05	Tethys	Tr.	E.	46.3	55.8
04/08/2010	20.31.13	Tethys	Sh.	I.	0.7	-19.5	17/08/2010	5.41.46	Tethys	Ec.	R.	-21.3	13.7	29/08/2010	12.14.34	Tethys	Sh.	E.	47.3	54.6
04/08/2010	22.43.25	Tethys	Tr.	E.	-23.6	-30.4	17/08/2010	20.44.58	Dione	Tr.	I.	-11.3	-24.8	30/08/2010	4.42.51	Dione	Occ.	D.	-23.9	1.0
04/08/2010	23.08.33	Tethys	Sh.	E.	-27.7	-30.9	17/08/2010	21.35.38	Dione	Sh.	I.	-20.3	-30.2	30/08/2010	7.46.26	Dione	Ec.	R.	9.7	34.1
05/08/2010	12.56.35	Dione	Occ.	D.	45.0	57.2	17/08/2010	23.40.33	Dione	Tr.	E.	-39.3	-34.5	30/08/2010	7.55.23	Tethys	Occ.	D.	11.3	35.7
05/08/2010	16.29.58	Dione	Ec.	R.	40.6	20.1	18/08/2010	0.04.08	Dione	Sh.	E.	-41.9	-33.7	30/08/2010	10.54.05	Tethys	Ec.	R.	40.2	56.7
05/08/2010	17.18.34	Rhea	Tr.	I.	33.7	11.2	18/08/2010	1.13.36	Tethys	Tr.	I.	-46.6	-28.6	30/08/2010	14.46.37	Rhea	Occ.	D.	41.5	32.7
05/08/2010	18.32.49	Tethys	Occ.	D.	21.3	-1.2	18/08/2010	1.45.07	Tethys	Sh.	I.	-47.0	-25.1	30/08/2010	17.09.47	Rhea	Occ.	R.	19.6	6.6
05/08/2010	19.21.32	Rhea	Sh.	I.	12.5	-9.9	18/08/2010	4.01.01	Tethys	Tr.	E.	-36.5	-4.6	31/08/2010	6.35.33	Tethys	Tr.	I.	-2.4	21.2
05/08/2010	20.30.52	Rhea	Tr.	E.	0.1	-19.7	18/08/2010	4.21.09	Tethys	Sh.	E.	-33.6	-0.4	31/08/2010	6.58.45	Tethys	Sh.	I.	1.7	25.5
05/08/2010	20.56.30	Rhea	Sh.	E.	-5.2	-22.8	18/08/2010	23.53.42	Tethys	Occ.	D.	-41.2	-34.5	31/08/2010	9.18.46	Tethys	Tr.	E.	26.6	48.3
05/08/2010	21.48.06	Tethys	Ec.	R.	-14.6	-27.7	19/08/2010	3.00.41	Tethys	Ec.	R.	-43.0	-14.8	31/08/2010	9.33.27	Tethys	Sh.	E.	29.0	50.1
06/08/2010	17.12.50	Tethys	Tr.	I.	34.0	12.0	19/08/2010	5.41.14	Dione	Occ.	D.	-20.2	13.3	31/08/2010	13.31.54	Dione	Tr.	I.	47.4	44.6
06/08/2010	17.50.21	Tethys	Sh.	I.	28.0	5.3	19/08/2010	7.08.30	Rhea	Tr.	I.	-4.2	29.4	31/08/2010	14.09.15	Dione	Sh.	I.	44.9	38.8
06/08/2010	20.03.03	Tethys	Tr.	E.	4.3	-16.3	19/08/2010	8.56.19	Rhea	Sh.	I.	15.7	48.0	31/08/2010	16.16.35	Dione	Tr.	E.	28.0	16.1
06/08/2010	20.27.30	Tethys	Sh.	E.	0.1	-19.5	19/08/2010	8.59.18	Dione	Ec.	R.	16.2	48.4	31/08/2010	16.33.07	Dione	Sh.	E.	25.3	13.0
06/08/2010	21.45.17	Dione	Tr.	I.	-14.8	-27.7	19/08/2010	9.58.30	Rhea	Tr.	E.	26.6	56.3	01/09/2010	5.15.43	Tethys	Occ.	D.	-17.0	6.3
06/08/2010	22.44.37	Dione	Sh.	I.	-25.1	-31.0	19/08/2010	10.10.10	Rhea	Sh.	E.	28.5	57.5	01/09/2010	8.12.58	Tethys	Ec.	R.	15.7	38.2
07/08/2010	0.47.29	Dione	Tr.	E.	-41.9	-28.0	19/08/2010	22.33.49	Tethys	Tr.	I.	-31.1	-34.6	01/09/2010	21.06.06	Rhea	Tr.	I.	-24.8	-32.3
07/08/2010	1.16.37	Dione	Sh.	E.	-44.3	-25.4	19/08/2010	23.04.13	Tethys	Sh.	I.	-35.6	-35.4	01/09/2010	22.28.30	Dione	Occ.	D.	-37.4	-39.0
07/08/2010	15.52.52	Tethys	Occ.	D.	44.1	26.5	20/08/2010	1.20.41	Tethys	Tr.	E.	-47.0	-28.4	01/09/2010	22.36.07	Rhea	Sh.	I.	-38.4	-39.3
07/08/2010	19.07.04	Tethys	Ec.	R.	1															

Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
04/09/2010	23.56.29	Tethys	Occ.	D.	-46.9	-40.0	18/09/2010	5.19.36	Tethys	Occ.	D.	-6.0	3.9	03/10/2010	10.41.11	Dione	Sh.	I.	46.7	43.8
05/09/2010	2.50.42	Tethys	Ec.	R.	-38.1	-20.1	18/09/2010	8.02.30	Tethys	Ec.	R.	23.7	32.6	03/10/2010	10.46.42	Dione	Tr.	I.	46.8	43.9
05/09/2010	22.36.41	Tethys	Tr.	I.	-40.4	-40.8	18/09/2010	9.04.31	Dione	Occ.	D.	33.6	41.5	03/10/2010	12.49.06	Dione	Tr.	E.	39.9	37.8
05/09/2010	22.55.56	Tethys	Sh.	I.	-42.6	-41.3	18/09/2010	11.38.08	Dione	Ec.	R.	47.5	49.2	03/10/2010	12.52.34	Dione	Sh.	E.	39.5	37.5
06/09/2010	1.03.23	Dione	Tr.	I.	-47.3	-35.1	19/09/2010	3.59.51	Tethys	Tr.	I.	-19.9	-11.2	04/10/2010	6.40.59	Tethys	Sh.	I.	18.7	15.3
06/09/2010	1.17.46	Tethys	Tr.	E.	-46.7	-33.5	19/09/2010	4.09.09	Tethys	Sh.	I.	-18.3	-9.5	04/10/2010	6.44.04	Tethys	Tr.	I.	19.3	15.8
06/09/2010	1.30.03	Tethys	Sh.	E.	-45.9	-32.0	19/09/2010	6.35.10	Tethys	Tr.	E.	8.8	17.5	04/10/2010	9.11.26	Tethys	Tr.	E.	41.0	37.4
06/09/2010	1.34.39	Dione	Sh.	I.	-45.6	-31.4	19/09/2010	6.41.50	Tethys	Sh.	E.	10.0	18.7	04/10/2010	9.11.58	Tethys	Sh.	E.	41.1	37.5
06/09/2010	3.42.45	Dione	Tr.	E.	-30.0	-11.6	19/09/2010	17.53.46	Dione	Tr.	I.	-1.3	-8.1	04/10/2010	19.36.29	Dione	Ec.	D.	-30.2	-31.3
06/09/2010	3.56.35	Dione	Sh.	E.	-27.8	-9.2	19/09/2010	18.08.01	Dione	Sh.	I.	-4.7	-10.7	04/10/2010	21.47.17	Dione	Ec.	R.	-46.8	-49.2
06/09/2010	9.47.41	Rhea	Tr.	I.	34.3	50.0	19/09/2010	20.17.07	Dione	Tr.	E.	-27.8	-32.4	05/10/2010	5.20.27	Tethys	Ec.	D.	4.8	1.0
06/09/2010	11.13.42	Rhea	Sh.	I.	44.6	54.4	19/09/2010	20.24.51	Dione	Sh.	E.	-29.1	-33.6	05/10/2010	7.51.24	Tethys	Ec.	R.	30.9	26.6
06/09/2010	11.36.25	Rhea	Sh.	E.	46.3	53.9	20/09/2010	0.11.43	Rhea	Tr.	I.	-48.1	-44.3	06/10/2010	3.59.56	Tethys	Sh.	I.	-9.8	-14.6
06/09/2010	11.48.45	Rhea	Tr.	E.	47.0	53.4	20/09/2010	0.49.32	Rhea	Tr.	E.	-46.0	-40.9	06/10/2010	4.04.37	Tethys	Tr.	I.	-8.9	-13.8
06/09/2010	21.16.53	Tethys	Occ.	D.	-29.7	-35.3	20/09/2010	2.40.06	Tethys	Occ.	D.	-32.7	-25.3	06/10/2010	4.23.48	Dione	Sh.	I.	-5.3	-10.2
07/09/2010	0.09.33	Tethys	Ec.	R.	-47.7	-40.0	20/09/2010	5.21.18	Tethys	Ec.	R.	-4.3	3.9	06/10/2010	4.33.38	Dione	Tr.	I.	-3.1	-8.4
07/09/2010	10.00.07	Dione	Occ.	D.	36.5	50.8	21/09/2010	1.20.21	Tethys	Tr.	I.	-42.9	-37.5	06/10/2010	6.30.41	Tethys	Sh.	E.	18.1	13.1
07/09/2010	12.51.35	Dione	Ec.	R.	47.7	47.5	21/09/2010	1.28.09	Tethys	Sh.	I.	-42.0	-36.5	06/10/2010	6.30.54	Tethys	Tr.	E.	18.1	13.1
07/09/2010	19.57.06	Tethys	Tr.	I.	-16.7	-25.1	21/09/2010	2.50.52	Dione	Occ.	D.	-30.5	-23.7	06/10/2010	6.31.06	Dione	Tr.	E.	18.1	13.2
07/09/2010	20.14.59	Tethys	Sh.	I.	-19.9	-27.8	21/09/2010	3.54.45	Tethys	Tr.	E.	-19.7	-12.5	06/10/2010	6.34.02	Dione	Sh.	E.	18.7	13.7
07/09/2010	22.37.25	Tethys	Tr.	E.	-41.4	-41.6	21/09/2010	4.00.37	Tethys	Sh.	E.	-18.6	-11.5	07/10/2010	2.39.24	Tethys	Ec.	D.	-23.6	-29.3
07/09/2010	22.48.54	Tethys	Sh.	E.	-42.6	-42.0	21/09/2010	5.19.43	Dione	Ec.	R.	-3.9	3.4	07/10/2010	5.10.42	Tethys	Occ.	R.	4.3	-0.9
08/09/2010	16.10.01	Rhea	Occ.	D.	24.1	14.8	22/09/2010	0.00.36	Tethys	Occ.	D.	-48.3	-45.8	07/10/2010	13.19.05	Dione	Ec.	D.	34.1	32.9
08/09/2010	18.02.11	Rhea	Occ.	R.	4.1	-6.0	22/09/2010	2.40.06	Tethys	Ec.	R.	-31.7	-25.8	07/10/2010	15.28.44	Dione	Ec.	R.	12.6	12.8
08/09/2010	18.37.18	Tethys	Occ.	D.	-2.0	-12.3	22/09/2010	11.40.08	Dione	Tr.	I.	47.3	47.5	08/10/2010	1.18.53	Tethys	Sh.	I.	-36.2	-42.4
08/09/2010	18.49.16	Dione	Tr.	I.	-4.9	-14.4	22/09/2010	11.50.40	Dione	Sh.	I.	47.2	47.0	08/10/2010	1.25.10	Tethys	Tr.	I.	-35.2	-41.5
08/09/2010	19.17.21	Dione	Sh.	I.	-10.2	-19.1	22/09/2010	13.59.44	Dione	Tr.	E.	36.3	32.7	08/10/2010	3.49.25	Tethys	Sh.	E.	-10.5	-17.0
08/09/2010	21.25.46	Dione	Tr.	E.	-32.2	-37.0	22/09/2010	14.06.26	Dione	Sh.	E.	35.4	31.6	08/10/2010	3.50.20	Tethys	Tr.	E.	-10.3	-16.8
08/09/2010	21.28.24	Tethys	Ec.	R.	-32.6	-37.2	22/09/2010	22.40.52	Tethys	Tr.	I.	-47.0	-47.6	08/10/2010	22.06.24	Dione	Sh.	I.	-48.9	-52.2
08/09/2010	21.38.16	Dione	Sh.	E.	-34.1	-38.2	22/09/2010	22.47.09	Tethys	Sh.	I.	-47.4	-47.8	08/10/2010	22.20.42	Dione	Tr.	I.	-49.3	-53.1
09/09/2010	17.17.31	Tethys	Tr.	I.	11.5	2.2	23/09/2010	1.14.20	Tethys	Tr.	E.	-42.9	-38.8	08/10/2010	23.58.20	Tethys	Ec.	D.	-45.6	-51.8
09/09/2010	17.34.02	Tethys	Sh.	I.	8.5	-0.5	23/09/2010	1.19.25	Tethys	Sh.	E.	-42.3	-38.2	09/10/2010	0.12.55	Dione	Tr.	E.	-44.2	-50.6
09/09/2010	19.57.04	Tethys	Tr.	E.	-18.0	-25.8	23/09/2010	20.37.19	Dione	Occ.	D.	-33.4	-36.8	09/10/2010	0.15.29	Dione	Sh.	E.	-43.9	-50.4
09/09/2010	20.07.44	Tethys	Sh.	E.	-19.9	-27.4	23/09/2010	21.21.07	Tethys	Occ.	D.	-39.6	-42.3	09/10/2010	2.30.08	Tethys	Occ.	R.	-24.1	-31.4
10/09/2010	3.46.04	Dione	Occ.	D.	-27.3	-11.9	23/09/2010	23.01.17	Dione	Ec.	R.	-48.3	-48.3	09/10/2010	22.37.49	Tethys	Sh.	I.	-49.5	-54.2
10/09/2010	6.33.15	Dione	Ec.	R.	3.1	18.9	23/09/2010	23.58.53	Tethys	Ec.	R.	-48.2	-46.6	09/10/2010	22.45.44	Tethys	Tr.	I.	-49.4	-54.4
10/09/2010	15.57.44	Tethys	Occ.	D.	25.0	16.5	24/09/2010	20.01.23	Tethys	Tr.	I.	-28.3	-31.8	10/10/2010	1.08.08	Tethys	Sh.	E.	-36.8	-44.5
10/09/2010	18.47.14	Tethys	Ec.	R.	-5.9	-14.7	24/09/2010	20.06.08	Tethys	Sh.	I.	-29.0	-32.6	10/10/2010	1.09.46	Tethys	Tr.	E.	-36.5	-44.3
10/09/2010	22.31.05	Rhea	Tr.	I.	-42.0	-42.5	24/09/2010	22.33.53	Tethys	Tr.	E.	-47.1	-48.2	10/10/2010	7.01.41	Dione	Ec.	D.	25.6	17.4
11/09/2010	0.13.28	Rhea	Tr.	E.	-48.1	-41.1	24/09/2010	22.38.11	Tethys	Sh.	E.	-47.4	-48.3	10/10/2010	9.10.09	Dione	Ec.	R.	42.7	35.4
11/09/2010	12.35.15	Dione	Tr.	I.	47.6	47.8	25/09/2010	5.26.37	Dione	Tr.	I.	0.2	3.9	10/10/2010	21.17.16	Tethys	Ec.	D.	-46.3	-48.3
11/09/2010	13.00.02	Dione	Sh.	I.	46.6	45.0	25/09/2010	5.33.18	Dione	Sh.	I.	1.3	5.1	10/10/2010	23.49.32	Tethys	Occ.	R.	-45.9	-53.2
11/09/2010	14.37.58	Tethys	Tr.	I.	36.7	30.3	25/09/2010	7.42.16	Dione	Tr.	E.	24.2	27.7	11/10/2010	15.49.00	Dione	Sh.	I.	6.3	8.0
11/09/2010	14.53.04	Tethys	Sh.	I.	34.6	27.7	25/09/2010	7.48.00	Dione	Sh.	E.	25.1	28.6	11/10/2010	16.07.54	Dione	Tr.	I.	2.9	4.7
11/09/2010	15.08.43	Dione	Tr.	E.	32.3	25.0	25/09/2010	18.41.38	Tethys	Occ.	D.	-15.0	-18.7	11/10/2010	17.54.33	Dione	Tr.	E.	-17.1	-15.2
11/09/2010	15.19.57	Dione	Sh.	E.	30.5	23.0	25/09/2010	21.17.39	Tethys	Ec.	R.	-40.1	-42.7	11/10/2010	17.56.54	Dione	Sh.	E.	-17.5	-15.6
11/09/2010	17.16.42	Tethys	Tr.	E.	10.3	1.8	26/09/2010	14.23.52	Dione	Occ.	D.	30.6	27.4	11/10/2010	19.56.44	Tethys	Sh.	I.	-37.3	-37.0
11/09/2010	17.26.34	Tethys	Sh.	E.	8.5	0.2	26/09/2010	16.42.49	Dione	Ec.	R.	6.5	3.1	11/10/2010	20.06.17	Tethys	Tr.	I.	-38.7	-38.5
12/09/2010	13.18.11	Tethys	Occ.	D.	45.1	42.3	26/09/2010	17.21.54	Tethys	Tr.	I.	-0.3	-4.3	11/10/2010	22.26.50	Tethys	Sh.	E.	-49.6	-54.6
12/09/2010	16.06.04	Tethys	Ec.	R.	22.3	14.3	26/09/2010	17.25.07	Tethys	Sh.	I.	-0.8	-5.0	11/10/2010	22.29.09	Tethys	Tr.	E.	-49.6	-54.7
12/09/2010	21.32.07	Dione	Occ.	D.	-35.4	-39.1	26/09/2010	19.53.26	Tethys	Tr.	E.	-28.2	-31.3	12/10/2010	18.36.11	Tethys	Ec.	D.	-25.1	-23.2
13/09/2010	0.14.54	Dione	Ec.	R.	-48.2	-41.7	26/09/2010	19.56.58	Tethys	Sh.	E.	-28.8	-31.9	12/10/2010	21.08.55	Tethys	Occ.	R.	-46.3	-48.0
13/09/2010	4.54.48	Rhea	Occ.	D.	-13.6	0.6	27/09/2010	16.02.10	Tethys	Occ.	D.	13.2	10.1	13/10/2010	0.44.16	Dione	Ec.	D.	-38.8	-48.5
13/09/2010	6.25.40	Rhea	Occ.	R.	3.5	17.0	27/09/2010	18.36.25	Tethys	Ec.	R.	-15.4	-18.5	13/10/2010	2.51.33	Dione	Ec.	R.	-18.0	-28.5
13/09/2010	11.58.25	Tethys	Tr.	I.	47.7	50.1	27/09/2010	23.13.12	Dione	Tr.	I.	-48.9	-49.8	13/10/2010	17.15.40	Tethys	Sh.	I.	-11.3	-8.6
13/09/2010	12.12.06	Tethys	Sh.	I.	47.8	49.1	27/09/2010	23.15.56	Dione	Sh.	I.	-49.0	-49.8	13/10/2010	17.26.50	Tethys	Tr.	I.	-13.4	-10.7
13/09/2010	14.36.20	Tethys	Tr.	E.	35.9	29.9	28/09/2010	1.24.40	Dione	Tr.	E.	-39.8	-38.9	13/10/2010	19.45.32	Tethys	Sh.	E.	-36.8	-35.7
13/09/2010	14.45.24	Tethys	Sh.	E.	34.6	28.4	28/09/2010	1.29.33	Dione	Sh.	E.	-39.1	-38.2	13/10/2010	19.48.32	Tethys	Tr.	E.	-37.2	-36.2
14/09/2010	6.21.19	Dione	Tr.	I.	3.3	16.0	28/09/2010	14.42.26	Tethys	Tr.	I.	26.4	23.7	14/10/2010	9.31.35	Dione	Sh.	I.	45.0	36.1
14/09/2010	6.42.42	Dione	Sh.	I.	7.2	19.8	28/09/2010	14.44.06	Tethys	Sh.	I.	26.1	23.4	14/10/2010	9.55.17	Dione	Tr.	I.	46.0	37.8
14/09/2010	8.51.35	Dione	Tr.	E.	29.7	40.9	28/09/2010	17.12.58	Tethys	Tr.	E.	0.0	-3.0	14/10/2010	11.35.58	Dione	Tr.	E.	42.9	39.1
14/09/2010	9.01.36	Dione	Sh.	E.	31.2	42.2	28/09/2010	17.15.43	Tethys	Sh.	E.	-0.4	-3.7	14/10/2010	11.38.18	Dione	Sh.	E.	42.7	39.0
14/09/2010	10.38.38	Tethys	Occ.	D.	43.6	50.8	29/09/2010	8.10.32	Dione	Occ.	D.	30.8	31.0	14/10/2010	15.55.07	Tethys	Ec.	D.	3.3	6.1
14/09/2010	13.24.53	Tethys																		

Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
19/10/2010	9.12.23	Tethys	Sh.	I.	44.7	32.8	03/11/2010	14.10.40	Tethys	Sh.	E.	8.9	17.4	21/11/2010	17.27.25	Dione	Sh.	I.	-38.0	-18.6
19/10/2010	9.28.29	Tethys	Tr.	I.	45.4	34.2	03/11/2010	14.20.08	Tethys	Tr.	E.	7.2	16.0	21/11/2010	19.15.15	Dione	Sh.	E.	-49.9	-38.5
19/10/2010	11.41.34	Tethys	Sh.	E.	40.5	37.0	03/11/2010	22.24.49	Dione	Ec.	D.	-46.9	-62.4	22/11/2010	8.51.35	Tethys	Sh.	I.	43.2	21.4
19/10/2010	11.46.32	Tethys	Tr.	E.	40.0	36.8	04/11/2010	0.21.48	Dione	Ec.	R.	-31.3	-57.5	22/11/2010	9.36.01	Tethys	Tr.	I.	39.8	25.1
19/10/2010	20.56.45	Dione	Sh.	I.	-47.6	-48.7	04/11/2010	10.22.47	Tethys	Ec.	D.	42.0	32.1	22/11/2010	11.16.22	Tethys	Sh.	E.	26.7	27.7
19/10/2010	21.30.41	Dione	Tr.	I.	-49.5	-53.0	04/11/2010	12.59.46	Tethys	Occ.	R.	20.7	25.9	22/11/2010	11.29.47	Tethys	Tr.	E.	24.6	27.4
19/10/2010	22.57.59	Dione	Tr.	E.	-47.9	-58.2	05/11/2010	7.12.07	Dione	Sh.	I.	38.9	12.8	23/11/2010	2.22.41	Dione	Ec.	D.	2.5	-42.1
19/10/2010	23.01.01	Dione	Sh.	E.	-47.7	-58.2	05/11/2010	9.02.13	Tethys	Sh.	I.	45.3	26.7	23/11/2010	4.09.25	Dione	Ec.	R.	21.3	-22.4
20/10/2010	7.51.50	Tethys	Ec.	D.	37.6	22.7	05/11/2010	9.08.36	Dione	Sh.	E.	45.3	27.3	23/11/2010	7.30.58	Tethys	Ec.	D.	44.2	11.5
20/10/2010	10.26.15	Tethys	Occ.	R.	45.5	37.2	05/11/2010	9.32.57	Tethys	Tr.	I.	44.8	29.3	23/11/2010	10.09.17	Tethys	Occ.	R.	35.7	26.6
21/10/2010	5.52.00	Dione	Ec.	D.	19.9	3.1	05/11/2010	11.29.16	Tethys	Sh.	E.	34.2	31.8	24/11/2010	6.10.22	Tethys	Sh.	I.	38.8	-0.5
21/10/2010	6.31.17	Tethys	Sh.	I.	26.5	9.8	05/11/2010	11.39.13	Tethys	Tr.	E.	32.8	31.4	24/11/2010	6.56.13	Tethys	Tr.	I.	42.7	6.3
21/10/2010	6.49.01	Tethys	Tr.	I.	29.3	12.8	06/11/2010	7.41.38	Tethys	Ec.	D.	42.0	16.9	24/11/2010	8.34.54	Tethys	Sh.	E.	43.7	19.2
21/10/2010	7.55.35	Dione	Ec.	R.	38.4	23.0	06/11/2010	10.18.50	Tethys	Occ.	R.	41.7	31.4	24/11/2010	8.48.36	Tethys	Tr.	E.	42.9	20.6
21/10/2010	9.00.14	Tethys	Sh.	E.	44.3	30.9	06/11/2010	16.07.22	Dione	Ec.	D.	-14.9	-1.3	24/11/2010	11.09.58	Dione	Sh.	I.	26.5	27.4
21/10/2010	9.05.49	Tethys	Tr.	E.	44.6	31.5	06/11/2010	18.02.58	Dione	Ec.	R.	-34.9	-23.1	24/11/2010	12.56.16	Dione	Sh.	E.	8.3	21.8
22/10/2010	5.10.43	Tethys	Ec.	D.	13.2	-4.7	07/11/2010	6.21.04	Tethys	Sh.	I.	33.3	4.3	25/11/2010	4.49.45	Tethys	Ec.	D.	28.8	-15.4
22/10/2010	7.45.32	Tethys	Occ.	R.	37.6	21.3	07/11/2010	6.53.23	Tethys	Tr.	I.	37.5	9.5	25/11/2010	7.28.05	Tethys	Occ.	R.	44.3	10.7
22/10/2010	14.39.19	Dione	Sh.	I.	11.7	16.4	07/11/2010	8.47.52	Tethys	Sh.	E.	45.2	24.7	25/11/2010	20.05.14	Dione	Ec.	D.	-51.3	-47.9
22/10/2010	15.18.47	Dione	Tr.	I.	4.5	10.0	07/11/2010	8.58.17	Tethys	Tr.	E.	45.2	25.8	25/11/2010	21.50.24	Dione	Ec.	R.	-42.8	-64.4
22/10/2010	16.38.29	Dione	Tr.	E.	-10.5	-4.0	08/11/2010	0.54.40	Dione	Sh.	I.	-23.4	-54.0	26/11/2010	3.29.10	Tethys	Sh.	I.	16.2	-30.3
22/10/2010	16.42.21	Dione	Sh.	E.	-11.3	-4.8	08/11/2010	2.49.46	Dione	Sh.	E.	-1.5	-34.2	26/11/2010	4.16.23	Tethys	Tr.	I.	24.1	-21.6
23/10/2010	3.50.10	Tethys	Sh.	I.	-0.4	-19.9	08/11/2010	5.00.28	Tethys	Ec.	D.	21.3	-10.2	26/11/2010	5.53.26	Tethys	Sh.	E.	37.7	-4.3
23/10/2010	4.09.32	Tethys	Tr.	I.	2.8	-16.3	08/11/2010	7.37.53	Tethys	Occ.	R.	42.2	15.8	26/11/2010	6.07.23	Tethys	Tr.	E.	39.2	-1.3
23/10/2010	6.18.54	Tethys	Sh.	E.	25.5	7.3	09/11/2010	3.39.54	Tethys	Sh.	I.	7.7	-25.2	27/11/2010	2.08.33	Tethys	Ec.	D.	2.4	-45.4
23/10/2010	6.25.05	Tethys	Tr.	E.	26.5	8.3	09/11/2010	4.13.48	Tethys	Tr.	I.	13.8	-18.9	27/11/2010	4.46.52	Tethys	Occ.	R.	29.4	-16.3
23/10/2010	23.34.35	Dione	Ec.	D.	-43.2	-58.5	09/11/2010	6.06.27	Tethys	Sh.	E.	32.2	1.6	27/11/2010	4.52.32	Dione	Sh.	I.	30.2	-15.2
24/10/2010	1.36.53	Dione	Ec.	R.	-24.8	-43.8	09/11/2010	6.17.19	Tethys	Tr.	E.	33.7	3.3	27/11/2010	6.37.16	Dione	Sh.	E.	42.1	2.9
24/10/2010	2.29.36	Tethys	Ec.	D.	-15.4	-34.8	09/11/2010	9.49.55	Dione	Ec.	D.	43.0	29.2	28/11/2010	0.47.57	Tethys	Sh.	I.	-12.3	-59.3
24/10/2010	5.04.47	Tethys	Occ.	R.	13.4	-6.3	09/11/2010	11.44.06	Dione	Ec.	R.	29.9	30.1	28/11/2010	1.36.31	Tethys	Tr.	I.	-2.7	-51.2
25/10/2010	1.09.03	Tethys	Sh.	I.	-29.0	-48.4	10/11/2010	2.19.18	Tethys	Ec.	D.	-6.8	-40.2	28/11/2010	3.11.57	Tethys	Sh.	E.	14.4	-33.9
25/10/2010	1.30.04	Tethys	Tr.	I.	-25.4	-45.1	10/11/2010	4.56.54	Tethys	Occ.	R.	21.9	-11.2	28/11/2010	3.26.09	Tethys	Tr.	E.	16.8	-31.2
25/10/2010	3.37.32	Tethys	Sh.	E.	-1.4	-22.6	10/11/2010	18.37.13	Dione	Sh.	I.	-41.9	-30.2	28/11/2010	13.47.48	Dione	Ec.	D.	-3.9	15.8
25/10/2010	3.44.19	Tethys	Tr.	E.	-0.2	-21.4	10/11/2010	20.30.55	Dione	Sh.	E.	-50.9	-50.5	28/11/2010	15.31.21	Dione	Ec.	R.	-23.1	1.4
25/10/2010	8.21.53	Dione	Sh.	I.	42.4	25.4	11/11/2010	0.58.43	Tethys	Sh.	I.	-20.9	-54.1	28/11/2010	23.27.19	Tethys	Ec.	D.	-26.2	-68.6
25/10/2010	9.07.16	Dione	Tr.	I.	45.2	30.4	11/11/2010	1.34.11	Tethys	Tr.	I.	-14.5	-48.3	29/11/2010	2.05.37	Tethys	Occ.	R.	3.1	-46.2
25/10/2010	10.18.30	Dione	Tr.	E.	44.9	35.2	11/11/2010	3.25.02	Tethys	Sh.	E.	6.3	-28.3	29/11/2010	22.06.44	Tethys	Sh.	I.	-38.7	-66.7
25/10/2010	10.23.39	Dione	Sh.	E.	44.7	35.4	11/11/2010	3.36.19	Tethys	Tr.	E.	8.3	-26.2	29/11/2010	22.35.06	Dione	Sh.	I.	-34.4	-68.9
25/10/2010	23.48.29	Tethys	Ec.	D.	-40.7	-58.2	11/11/2010	23.38.07	Tethys	Ec.	D.	-34.0	-64.0	29/11/2010	22.56.37	Tethys	Tr.	I.	-30.8	-69.6
26/10/2010	2.24.01	Tethys	Occ.	R.	-15.2	-36.2	12/11/2010	2.15.54	Tethys	Occ.	R.	-6.1	-41.2	30/11/2010	0.18.14	Dione	Sh.	E.	-16.4	-63.9
26/10/2010	17.17.08	Dione	Ec.	D.	-20.2	-12.3	12/11/2010	3.32.28	Dione	Ec.	D.	8.2	-27.1	30/11/2010	0.30.28	Tethys	Sh.	E.	-14.2	-62.2
26/10/2010	19.18.09	Dione	Ec.	R.	-39.8	-34.6	12/11/2010	5.25.13	Dione	Ec.	R.	27.5	-6.6	30/11/2010	0.44.54	Tethys	Tr.	E.	-11.5	-60.1
26/10/2010	22.27.56	Tethys	Sh.	I.	-48.6	-60.0	12/11/2010	22.17.33	Tethys	Sh.	I.	-44.8	-64.5	30/11/2010	20.46.06	Tethys	Ec.	D.	-48.1	-55.3
26/10/2010	22.50.34	Tethys	Tr.	I.	-46.8	-60.6	12/11/2010	22.54.33	Tethys	Tr.	I.	-40.1	-65.9	30/11/2010	23.24.21	Tethys	Occ.	R.	-25.5	-69.2
27/10/2010	0.56.11	Tethys	Sh.	E.	-30.0	-50.8	13/11/2010	0.43.36	Tethys	Sh.	E.	-22.4	-56.8	01/12/2010	7.30.23	Dione	Ec.	D.	44.4	9.9
27/10/2010	1.03.32	Tethys	Tr.	E.	-28.8	-49.7	13/11/2010	0.55.18	Tethys	Tr.	E.	-20.3	-55.0	01/12/2010	9.12.17	Dione	Ec.	R.	38.7	21.5
27/10/2010	21.07.21	Tethys	Ec.	D.	-50.0	-52.6	13/11/2010	12.19.46	Dione	Sh.	I.	21.9	27.0	01/12/2010	19.25.30	Tethys	Sh.	I.	-51.7	-41.0
27/10/2010	23.43.13	Tethys	Occ.	R.	-40.5	-59.2	13/11/2010	14.12.03	Dione	Sh.	E.	2.1	15.0	01/12/2010	20.16.40	Tethys	Tr.	I.	-50.1	-50.3
28/10/2010	2.04.27	Dione	Sh.	I.	-17.5	-40.1	13/11/2010	20.56.57	Tethys	Ec.	D.	-50.6	-55.2	01/12/2010	21.48.58	Tethys	Sh.	E.	-40.3	-64.8
28/10/2010	2.56.19	Dione	Tr.	I.	-8.0	-30.8	13/11/2010	23.34.52	Tethys	Occ.	R.	-33.5	-64.8	01/12/2010	22.03.37	Tethys	Tr.	E.	-38.2	-66.6
28/10/2010	3.57.53	Dione	Tr.	E.	3.7	-19.5	14/11/2010	19.36.22	Tethys	Sh.	I.	-49.4	-41.6	02/12/2010	16.17.40	Dione	Sh.	I.	-33.6	-7.0
28/10/2010	4.04.56	Dione	Sh.	E.	5.0	-18.2	14/11/2010	20.14.54	Tethys	Tr.	I.	-51.0	-48.4	02/12/2010	17.59.10	Dione	Sh.	E.	-47.3	-25.0
28/10/2010	19.46.48	Tethys	Sh.	I.	-44.4	-40.2	14/11/2010	21.15.01	Dione	Ec.	D.	-49.7	-58.0	02/12/2010	18.04.53	Tethys	Ec.	D.	-47.8	-26.1
28/10/2010	20.11.05	Tethys	Tr.	I.	-46.8	-44.3	14/11/2010	22.02.10	Tethys	Sh.	E.	-45.7	-63.7	02/12/2010	20.43.03	Tethys	Occ.	R.	-47.8	-54.9
28/10/2010	22.14.49	Tethys	Sh.	E.	-49.0	-60.0	14/11/2010	22.14.15	Tethys	Tr.	E.	-44.4	-64.7	03/12/2010	16.44.17	Tethys	Sh.	I.	-38.3	-11.6
28/10/2010	22.22.44	Tethys	Tr.	E.	-48.5	-60.4	14/11/2010	23.06.19	Dione	Ec.	R.	-37.4	-66.3	03/12/2010	17.36.41	Tethys	Tr.	I.	-45.3	-20.9
29/10/2010	10.59.42	Dione	Ec.	D.	40.8	34.5	15/11/2010	18.15.45	Tethys	Ec.	D.	-41.6	-26.9	03/12/2010	19.07.29	Tethys	Sh.	E.	-51.6	-37.7
29/10/2010	12.59.23	Dione	Ec.	R.	24.5	27.6	15/11/2010	20.53.48	Tethys	Occ.	R.	-50.6	-55.0	03/12/2010	19.22.18	Tethys	Tr.	E.	-51.7	-40.4
29/10/2010	18.26.13	Tethys	Ec.	D.	-33.8	-25.8	16/11/2010	6.02.19	Dione	Sh.	I.	34.8	-0.3	04/12/2010	1.12.58	Dione	Ec.	D.	-3.4	-56.3
29/10/2010	21.02.23	Tethys	Occ.	R.	-50.1	-52.5	16/11/2010	7.53.08	Dione	Sh.	E.	44.4	16.0	04/12/2010	2.53.11	Dione	Ec.	R.	14.7	-38.3
30/10/2010	17.05.40	Tethys	Sh.	I.	-20.8	-11.2	16/11/2010	16.55.11	Tethys	Sh.	I.	-29.9	-12.2	04/12/2010	15.23.39	Tethys	Ec.	D.	-25.7	2.2
30/10/2010	17.31.34	Tethys	Tr.	I.	-25.4	-15.9	16/11/2010	17.35.13	Tethys	Tr.	I.	-36.3	-19.5	04/12/2010	18.01.44	Tethys	Occ.	R.	-48.3	-25.5
30/10/2010	19.33.26	Tethys	Sh.	E.	-43.7	-38.3	16/11/2010	19.20.44	Tethys	Sh.	E.	-48.9	-39.0	05/12/2010	10.00.15	Dione	Sh.	I.	30.8	24.1
30/10/2010	19																			

Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S	Date	Time	M	Phe	Pha	h	h S
09/12/2010	12.38.09	Dione	Ec.	D.	1.6	21.7	17/12/2010	0.32.31	Tethys	Tr.	E.	-1.9	-64.4	24/12/2010	13.58.41	Dione	Sh.	I.	-24.0	14.1
09/12/2010	14.14.54	Dione	Ec.	R.	-16.7	11.7	17/12/2010	17.46.03	Dione	Ec.	D.	-50.9	-22.2	24/12/2010	15.25.40	Dione	Sh.	E.	-38.4	2.5
10/12/2010	7.19.56	Tethys	Ec.	D.	43.8	7.0	17/12/2010	19.17.15	Dione	Ec.	R.	-50.6	-39.0	25/12/2010	9.49.56	Tethys	Ec.	D.	20.6	22.0
10/12/2010	9.57.38	Tethys	Occ.	R.	28.4	23.3	17/12/2010	20.34.57	Tethys	Ec.	D.	-42.8	-53.2	25/12/2010	12.25.52	Tethys	Occ.	R.	-7.7	22.5
10/12/2010	21.25.27	Dione	Sh.	I.	-39.2	-61.9	17/12/2010	23.11.53	Tethys	Occ.	R.	-16.9	-71.4	25/12/2010	22.54.07	Dione	Ec.	D.	-14.8	-71.0
10/12/2010	23.01.49	Dione	Sh.	E.	-23.3	-71.0	18/12/2010	19.14.21	Tethys	Sh.	I.	-50.6	-38.4	26/12/2010	0.19.20	Dione	Ec.	R.	1.4	-66.7
11/12/2010	5.59.20	Tethys	Sh.	I.	42.5	-5.8	18/12/2010	20.15.03	Tethys	Tr.	I.	-44.9	-49.6	26/12/2010	8.29.20	Tethys	Sh.	I.	32.3	14.6
11/12/2010	6.56.17	Tethys	Tr.	I.	44.1	3.5	18/12/2010	21.35.19	Tethys	Sh.	E.	-33.2	-63.1	26/12/2010	9.32.51	Tethys	Tr.	I.	22.8	20.7
11/12/2010	8.21.26	Tethys	Sh.	E.	39.9	14.9	18/12/2010	21.51.03	Tethys	Tr.	E.	-30.6	-65.4	26/12/2010	10.49.09	Tethys	Sh.	E.	9.6	24.5
11/12/2010	8.36.50	Tethys	Tr.	E.	38.3	16.6	19/12/2010	2.33.20	Dione	Sh.	I.	20.4	-44.0	26/12/2010	11.04.59	Tethys	Tr.	E.	6.8	24.7
12/12/2010	4.38.42	Tethys	Ec.	D.	35.3	-20.1	19/12/2010	4.04.13	Dione	Sh.	E.	34.1	-27.1	27/12/2010	7.08.41	Tethys	Ec.	D.	40.7	3.9
12/12/2010	6.20.46	Dione	Ec.	D.	43.6	-1.7	19/12/2010	17.53.42	Tethys	Ec.	D.	-51.6	-23.5	27/12/2010	7.41.24	Dione	Sh.	I.	37.7	8.5
12/12/2010	7.16.14	Tethys	Occ.	R.	43.7	6.3	19/12/2010	20.30.24	Tethys	Occ.	R.	-42.5	-52.2	27/12/2010	9.06.21	Dione	Sh.	E.	26.4	18.5
12/12/2010	7.55.43	Dione	Ec.	R.	41.6	11.6	20/12/2010	11.28.43	Dione	Ec.	D.	6.6	24.5	27/12/2010	9.44.19	Tethys	Occ.	R.	20.3	21.6
13/12/2010	3.18.05	Tethys	Sh.	I.	24.3	-35.0	20/12/2010	12.57.59	Dione	Ec.	R.	-10.1	20.0	28/12/2010	5.48.04	Tethys	Sh.	I.	43.7	-9.4
13/12/2010	4.16.04	Tethys	Tr.	I.	32.9	-24.3	20/12/2010	16.33.05	Tethys	Sh.	I.	-45.5	-9.2	28/12/2010	6.52.08	Tethys	Tr.	I.	41.6	1.5
13/12/2010	5.39.55	Tethys	Sh.	E.	41.7	-9.4	20/12/2010	17.34.36	Tethys	Tr.	I.	-50.9	-19.9	28/12/2010	8.07.36	Tethys	Sh.	E.	34.2	12.0
13/12/2010	5.55.25	Tethys	Tr.	E.	42.6	-6.8	20/12/2010	18.53.47	Tethys	Sh.	E.	-51.3	-34.4	28/12/2010	8.23.26	Tethys	Tr.	E.	32.1	13.9
13/12/2010	15.08.03	Dione	Sh.	I.	-28.8	4.4	20/12/2010	19.09.33	Tethys	Tr.	E.	-50.4	-37.4	28/12/2010	16.36.51	Dione	Ec.	D.	-49.1	-9.0
13/12/2010	16.42.39	Dione	Sh.	E.	-43.4	-11.2	21/12/2010	15.12.27	Tethys	Ec.	D.	-34.6	4.1	28/12/2010	17.59.58	Dione	Ec.	R.	-52.2	-23.7
14/12/2010	1.57.27	Tethys	Ec.	D.	11.1	-49.9	21/12/2010	17.48.54	Tethys	Occ.	R.	-51.7	-22.4	29/12/2010	4.27.26	Tethys	Ec.	D.	40.4	-23.7
14/12/2010	4.34.48	Tethys	Occ.	R.	35.7	-21.0	21/12/2010	20.16.00	Dione	Sh.	I.	-43.4	-49.5	29/12/2010	7.02.46	Tethys	Occ.	R.	40.6	3.0
15/12/2010	0.03.24	Dione	Ec.	D.	-9.4	-67.9	21/12/2010	21.44.58	Dione	Sh.	E.	-29.8	-64.3	30/12/2010	1.24.08	Dione	Sh.	I.	15.5	-57.1
15/12/2010	0.36.50	Tethys	Sh.	I.	-2.6	-63.5	22/12/2010	13.51.50	Tethys	Sh.	I.	-21.4	14.8	30/12/2010	2.46.59	Dione	Sh.	E.	28.9	-42.3
15/12/2010	1.35.47	Tethys	Tr.	I.	7.9	-53.9	22/12/2010	14.54.05	Tethys	Tr.	I.	-32.2	6.8	30/12/2010	3.06.49	Tethys	Sh.	I.	31.7	-38.6
15/12/2010	1.36.30	Dione	Ec.	R.	8.0	-53.8	22/12/2010	16.12.14	Tethys	Sh.	E.	-43.9	-5.4	30/12/2010	4.11.21	Tethys	Tr.	I.	39.3	-26.7
15/12/2010	2.58.23	Tethys	Sh.	E.	22.2	-38.9	22/12/2010	16.28.03	Tethys	Tr.	E.	-45.8	-8.1	30/12/2010	5.26.02	Tethys	Sh.	E.	43.6	-13.3
15/12/2010	3.13.59	Tethys	Tr.	E.	24.7	-36.0	23/12/2010	5.11.24	Dione	Ec.	D.	42.0	-15.4	30/12/2010	5.41.53	Tethys	Tr.	E.	43.7	-10.5
15/12/2010	23.16.12	Tethys	Ec.	D.	-17.4	-71.2	23/12/2010	6.38.41	Dione	Ec.	R.	43.3	-0.1	31/12/2010	1.46.10	Tethys	Ec.	D.	19.9	-53.4
16/12/2010	1.53.21	Tethys	Occ.	R.	11.7	-50.9	23/12/2010	12.31.12	Tethys	Ec.	D.	-7.2	22.0	31/12/2010	4.21.12	Tethys	Occ.	R.	40.4	-24.9
16/12/2010	8.50.41	Dione	Sh.	I.	34.5	17.5	23/12/2010	15.07.23	Tethys	Occ.	R.	-35.0	5.0	31/12/2010	10.19.37	Dione	Ec.	D.	11.5	23.7
16/12/2010	10.23.27	Dione	Sh.	E.	20.7	23.9	24/12/2010	11.10.35	Tethys	Sh.	I.	7.2	24.6	31/12/2010	11.40.33	Dione	Ec.	R.	-3.0	24.7
16/12/2010	21.55.35	Tethys	Sh.	I.	-31.0	-66.0	24/12/2010	12.13.30	Tethys	Tr.	I.	-4.5	23.1							
16/12/2010	22.55.27	Tethys	Tr.	I.	-20.6	-71.2	24/12/2010	13.30.42	Tethys	Sh.	E.	-18.9	17.2							
17/12/2010	0.16.51	Tethys	Sh.	E.	-5.5	-66.5	24/12/2010	13.46.31	Tethys	Tr.	E.	-21.8	15.5							

Date = data  
 Time = orario  
 Phe = fenomeno  
 Pha = fase  
 H = altitudine di Saturno sull'orizzonte  
 H S = altitudine del Sole sull'orizzonte

Date in the format dd/mm/yyyy  
 Phe = phenomenon  
 Pha = phase  
 H = altitude of Saturn above the horizon  
 H S = altitude of the Sun above the horizon

# CONGIUNZIONI TRA I SATELLITI DI SATURNO

## CONJUNCT. BETWEEN THE SATELLITES OF SATURN

Sono stati presi in considerazione solo i 4 satelliti principali - Only 4 main satellites

Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S
01/01/2010	4.58.16	Dione/Rhea	11"	48.3	-18.3	06/02/2010	0.58.20	Dione/Rhea	11"	44.1	-57.1	18/03/2010	15.00.50	Tethys/Dione	-2"	-26.7	24.5
01/01/2010	11.16.22	Rhea/Titan	-20"	-5.0	25.0	06/02/2010	6.34.02	Tethys/Dione	-7"	20.9	2.0	18/03/2010	21.18.06	Dione/Rhea	8"	39.2	-40.5
01/01/2010	13.18.19	Tethys/Dione	-9"	-26.8	19.1	07/02/2010	20.27.42	Dione/Rhea	-7"	2.2	-43.3	18/03/2010	22.58.47	Tethys/Rhea	8"	48.9	-48.4
01/01/2010	20.32.45	Tethys/Titan	-19"	-24.0	-51.2	08/02/2010	13.40.19	Tethys/Dione	-8"	-46.6	25.3	20/03/2010	13.45.22	Tethys/Rhea	-3"	-36.5	36.7
02/01/2010	13.28.51	Dione/Titan	-20"	-29.1	18.3	09/02/2010	17.34.24	Tethys/Dione	4"	-27.6	-11.2	20/03/2010	16.01.26	Dione/Rhea	-7"	-14.9	14.4
02/01/2010	16.43.27	Tethys/Dione	9"	-47.7	-9.5	10/02/2010	23.24.32	Tethys/Rhea	9"	35.0	-62.1	20/03/2010	16.48.11	Tethys/Dione	5"	-6.4	5.9
02/01/2010	23.40.31	Dione/Rhea	-11"	11.0	-70.2	11/02/2010	1.22.02	Dione/Rhea	8"	47.5	-52.6	21/03/2010	9.48.09	Tethys/Rhea	-4"	-40.9	43.5
03/01/2010	10.18.52	Rhea/Rhea	-10"	4.4	23.9	11/02/2010	3.30.12	Tethys/Titan	18"	44.6	-30.8	21/03/2010	20.37.19	Tethys/Dione	-6"	35.2	-34.1
03/01/2010	20.25.05	Tethys/Dione	-6"	-24.0	-49.6	11/02/2010	5.57.30	Dione/Titan	19"	23.8	-3.4	22/03/2010	6.04.47	Tethys/Titan	-12"	-6.7	9.0
04/01/2010	23.01.54	Dione/Rhea	3"	5.4	-70.4	11/02/2010	19.45.00	Tethys/Dione	-5"	-2.4	-34.8	22/03/2010	23.54.06	Dione/Titan	-14"	49.1	-46.4
05/01/2010	2.27.01	Tethys/Rhea	4"	39.5	-46.2	11/02/2010	23.01.32	Rhea/Titan	15"	32.1	-61.3	23/03/2010	0.01.29	Tethys/Dione	6"	48.8	-46.0
05/01/2010	8.41.43	Rhea/Rhea	2"	20.6	16.1	12/02/2010	12.36.04	Tethys/Dione	-7"	-43.2	32.1	23/03/2010	0.22.51	Tethys/Titan	-9"	47.4	-44.7
05/01/2010	13.22.25	Dione/Rhea	2"	-29.9	19.3	12/02/2010	23.53.30	Tethys/Dione	8"	40.1	-60.9	23/03/2010	1.18.32	Tethys/Rhea	6"	41.7	-39.3
05/01/2010	21.20.55	Tethys/Dione	3"	-12.8	-58.9	14/02/2010	15.42.31	Dione/Rhea	7"	-40.4	9.7	23/03/2010	1.38.18	Rhea/Titan	-16"	39.2	-36.8
05/01/2010	22.08.47	Tethys/Rhea	6"	-3.7	-65.8	15/02/2010	6.56.28	Tethys/Dione	6"	10.3	7.7	23/03/2010	9.50.18	Tethys/Titan	-12"	-41.9	44.5
06/01/2010	0.19.07	Dione/Rhea	3"	20.1	-66.7	16/02/2010	13.27.53	Tethys/Dione	-1"	-47.0	29.0	23/03/2010	19.49.51	Dione/Rhea	3"	29.1	-26.2
07/01/2010	2.59.49	Tethys/Dione	-8"	44.0	-40.2	17/02/2010	0.13.25	Tethys/Dione	-1"	44.3	-58.4	24/03/2010	3.50.11	Tethys/Dione	-3"	16.8	-15.3
07/01/2010	12.41.48	Tethys/Rhea	-9"	-24.6	22.9	17/02/2010	5.52.00	Tethys/Dione	-2"	20.5	-2.9	25/03/2010	15.16.36	Tethys/Rhea	-7"	-18.9	23.5
08/01/2010	0.25.16	Dione/Rhea	-11"	22.5	-65.8	17/02/2010	15.58.37	Tethys/Rhea	-9"	-36.9	7.8	25/03/2010	16.38.28	Dione/Rhea	-7"	-3.9	8.7
08/01/2010	22.34.21	Rhea/Titan	13"	3.2	-68.1	17/02/2010	20.37.40	Dione/Rhea	-8"	11.6	-42.6	26/03/2010	5.39.01	Tethys/Dione	3"	-4.9	5.5
09/01/2010	10.01.57	Tethys/Dione	-7"	3.3	23.5	18/02/2010	8.24.17	Tethys/Titan	-14"	-8.4	22.1	27/03/2010	10.17.36	Tethys/Dione	-5"	-45.0	48.4
09/01/2010	18.31.07	Dione/Titan	20"	-37.9	-27.7	18/02/2010	12.57.53	Dione/Titan	-18"	-46.3	32.5	27/03/2010	11.24.25	Dione/Rhea	7"	-45.7	50.6
09/01/2010	19.11.53	Dione/Rhea	11"	-32.1	-35.2	18/02/2010	13.29.09	Tethys/Dione	7"	-47.1	29.5	28/03/2010	4.11.10	Tethys/Rhea	5"	10.0	-10.3
09/01/2010	23.04.35	Rhea/Titan	9"	9.4	-69.8	18/02/2010	15.40.40	Tethys/Titan	-11"	-38.6	11.0	29/03/2010	17.17.51	Tethys/Dione	-4"	6.6	2.4
10/01/2010	14.22.55	Tethys/Dione	3"	-41.0	13.4	19/02/2010	5.43.38	Tethys/Rhea	5"	20.6	-4.2	29/03/2010	17.41.08	Tethys/Rhea	-5"	10.9	-1.4
11/01/2010	3.26.18	Rhea/Titan	14"	47.1	-35.2	19/02/2010	9.24.28	Rhea/Titan	-20"	-19.9	29.9	30/03/2010	4.54.58	Dione/Titan	12"	0.7	-0.8
11/01/2010	16.48.36	Dione/Rhea	-4"	-46.8	-8.9	19/02/2010	11.41.39	Tethys/Titan	-17"	-40.5	36.7	30/03/2010	6.23.52	Rhea/Titan	14"	-16.1	15.0
12/01/2010	15.55.27	Tethys/Rhea	-8"	-47.7	0.7	20/02/2010	20.33.22	Tethys/Dione	7"	13.2	-41.1	30/03/2010	14.14.24	Dione/Rhea	-3"	-25.7	35.1
12/01/2010	16.28.26	Tethys/Dione	-6"	-47.4	-5.2	21/02/2010	10.52.28	Dione/Rhea	-7"	-35.2	37.0	30/03/2010	22.19.54	Tethys/Dione	1"	49.7	-42.3
13/01/2010	20.16.25	Tethys/Dione	9"	-18.8	-46.4	21/02/2010	18.20.53	Tethys/Rhea	-9"	-10.7	-17.2	01/04/2010	12.01.39	Dione/Rhea	7"	-42.0	51.3
14/01/2010	5.13.21	Tethys/Rhea	8"	45.0	-15.5	22/02/2010	0.41.18	Tethys/Dione	-3"	48.0	-54.2	01/04/2010	23.49.36	Tethys/Dione	-4"	47.0	-42.6
14/01/2010	19.53.34	Dione/Rhea	10"	-22.1	-42.1	24/02/2010	2.46.42	Tethys/Dione	5"	43.9	-35.4	03/04/2010	3.28.09	Tethys/Dione	5"	13.4	-15.9
16/01/2010	3.27.17	Tethys/Dione	5"	48.0	-34.9	24/02/2010	8.19.19	Tethys/Rhea	9"	-11.9	23.3	03/04/2010	6.42.10	Dione/Rhea	-6"	-22.1	19.6
16/01/2010	14.36.45	Dione/Rhea	-11"	-44.7	12.7	24/02/2010	15.51.36	Dione/Rhea	7"	-33.6	10.6	03/04/2010	21.06.53	Tethys/Rhea	-6"	46.2	-34.2
18/01/2010	5.10.44	Tethys/Dione	-4"	43.9	-15.7	25/02/2010	6.50.52	Tethys/Dione	-8"	4.0	9.4	04/04/2010	6.56.46	Tethys/Dione	-5"	-25.2	22.6
18/01/2010	11.29.32	Dione/Rhea	5"	-19.5	27.5	26/02/2010	10.15.30	Tethys/Dione	7"	-32.8	36.9	05/04/2010	6.32.54	Dione/Rhea	2"	-21.9	18.6
18/01/2010	11.56.08	Tethys/Titan	-20"	-24.1	27.0	26/02/2010	12.33.19	Tethys/Titan	16"	-46.4	37.0	05/04/2010	10.17.55	Tethys/Rhea	4"	-45.7	52.0
18/01/2010	16.29.33	Rhea/Titan	-22"	-46.3	-4.2	26/02/2010	14.03.56	Rhea/Titan	19"	-44.7	27.7	05/04/2010	10.48.15	Tethys/Dione	2"	-45.3	53.7
18/01/2010	18.55.37	Dione/Titan	-19"	-29.1	-30.6	26/02/2010	20.31.28	Tethys/Rhea	-6"	17.5	-39.3	05/04/2010	18.31.22	Dione/Rhea	1"	25.3	-9.9
19/01/2010	8.43.12	Tethys/Rhea	9"	10.5	17.7	27/02/2010	10.43.39	Dione/Titan	15"	-37.3	38.9	06/04/2010	7.52.14	Dione/Rhea	2"	-34.7	33.0
19/01/2010	9.58.11	Tethys/Dione	8"	-3.2	24.7	27/02/2010	13.55.18	Tethys/Dione	-5"	-45.0	29.1	06/04/2010	14.54.57	Rhea/Titan	-10"	-13.6	29.9
20/01/2010	22.01.53	Tethys/Rhea	-7"	5.9	-62.1	28/02/2010	6.11.18	Dione/Rhea	7"	9.0	3.4	07/04/2010	12.56.04	Tethys/Dione	-3"	-32.4	48.3
21/01/2010	15.17.30	Dione/Rhea	-10"	-47.6	8.0	28/02/2010	10.40.13	Tethys/Rhea	8"	-37.3	39.1	07/04/2010	20.30.55	Tethys/Titan	-11"	44.4	-28.5
21/01/2010	17.00.11	Tethys/Dione	7"	-42.9	-9.1	01/03/2010	14.34.38	Tethys/Dione	3"	-40.7	24.2	08/04/2010	5.05.34	Dione/Titan	-11"	-8.6	3.4
22/01/2010	21.48.03	Tethys/Dione	-2"	4.9	-59.8	02/03/2010	20.28.26	Tethys/Dione	-7"	20.0	-37.8	08/04/2010	7.22.05	Dione/Rhea	-6"	-31.6	28.4
23/01/2010	10.06.35	Dione/Rhea	11"	-8.1	26.1	03/03/2010	0.35.35	Tethys/Rhea	-9"	49.2	-51.5	08/04/2010	17.09.30	Tethys/Dione	5"	13.0	5.9
23/01/2010	11.15.52	Tethys/Rhea	11"	-20.5	28.6	03/03/2010	11.00.33	Dione/Rhea	-6"	-41.1	41.0	10/04/2010	2.06.52	Dione/Rhea	6"	22.8	-26.4
24/01/2010	23.29.31	Tethys/Dione	7"	24.5	-67.0	05/03/2010	3.29.28	Tethys/Dione	-6"	33.5	-25.1	10/04/2010	13.37.03	Tethys/Rhea	6"	-24.1	43.6
25/01/2010	6.17.56	Dione/Rhea	-6"	31.5	-2.7	05/03/2010	13.53.29	Tethys/Rhea	7"	-43.0	31.2	11/04/2010	0.11.54	Tethys/Dione	3"	40.5	-38.1
25/01/2010	12.52.03	Tethys/Titan	17"	-37.0	25.8	05/03/2010	22.02.17	Rhea/Titan	-15"	37.4	-49.6	11/04/2010	23.53.12	Dione/Rhea	-2"	42.4	-38.6
25/01/2010	21.18.02	Rhea/Titan	22"	1.7	-54.6	06/03/2010	7.45.42	Tethys/Dione	2"	-13.2	21.4	12/04/2010	3.27.53	Tethys/Rhea	-2"	6.6	-13.1
26/01/2010	1.13.57	Tethys/Rhea	-10"	40.7	-57.2	06/03/2010	18.22.51	Dione/Titan	-17"	0.5	-14.8	12/04/2010	6.10.08	Tethys/Dione	-0"	-22.9	16.5
26/01/2010	3.17.22	Tethys/Dione	-9"	48.4	-35.9	06/03/2010	20.50.51	Tethys/Titan	-16"	26.9	-40.2	14/04/2010	6.44.14	Tethys/Dione	4"	-29.6	23.3
27/01/2010	6.41.49	Tethys/Dione	8"	26.4	1.5	07/03/2010	1.24.37	Dione/Rhea	-7"	47.3	-44.5	14/04/2010	15.59.30	Tethys/Rhea	5"	4.9	19.9
27/01/2010	15.44.31	Tethys/Rhea	5"	-46.7	5.2	07/03/2010	3.07.57	Tethys/Rhea	-6"	35.6	-28.3	14/04/2010	22.35.37	Tethys/Titan	7"	48.8	-37.7
28/01/2010	5.20.35	Tethys/Rhea	3"	38.2	-12.9	08/03/2010	9.52.27	Tethys/Dione	-5"	-35.2	38.9	15/04/2010	2.44.46	Dione/Rhea	5"	12.3	-19.1
28/01/2010	10.33.12	Tethys/Dione	-5"	-16.5	28.7	09/03/2010	13.41.50	Tethys/Dione	7"	-42.4	33.9	15/04/2010	11.00.59	Tethys/Titan	6"	-41.8	57.7
28/01/2010	10.41.56	Dione/Rhea	9"	-18.1	29.1	10/03/2010	6.05.39	Dione/Rhea	5"	2.6	5.4	16/04/2010	1.51.00	Tethys/Titan	9"	21.3	-26.5
28/01/2010	11.23.03	Tethys/Rhea	5"	-25.2	29.9	10/03/2010	17.10.33	Tethys/Dione	-7"	-10.2	0.1	16/04/2010	9.37.16	Rhea/Titan	9"	-45.4	52.0
30/01/2010	3.35.08	Tethys/Rhea	-10"	47.5	-32.1	11/03/2010	20.50.20	Tethys/Dione	4"	30.4	-38.8	16/04/2010	13.49.38	Tethys/Dione	4"	-17.5	43.1
30/01/2010	12.27.42	Tethys/Dione	5"	-36.3	28.7	12/03/2010	1.54.11	Dione/Rhea	-9"	42.7	-38.6	16/04/2010	21.26.48	Dione/Rhea	-6"	50.6	-32.4
31/01/2010	16.59.46	Tethys/Dione	-8"	-38.3	-6.9	12/03/2010	6.35.01	Tethys/Rhea	-8"	-4.6	11.3	17/04/2010	5.58.48	Tethys/Rhea	-5"	-24.3	15.8
01/02/2010	1.24.03	Dione/Rhea	6"	44.5	-54.6	13/03/2010	19.55.52	Tethys/Rhea	5"	22.7	-29.7	17/04/2010	17.53.28	Tethys/Dione	-1"	27.7	0.0
01/02/2010	17.34.06	Tethys/Rhea	11"	-32.9	-12.9	13/03/2010	20.45.48	Dione/Rhea	7"	31.1	-37.6	18/04/2010	18.23.55	Dione/Rhea	2"	33.4	-5.8
02/02/2010	5.01.10	Rhea/Titan	-20"	38.1	-15.7	13/03/2010	22.24.10	Tethys/Dione	-3"	44.5	-48.7	19/04/2010	18.16.47	Tethys/Rhea	4"	33.0	-4.2
02/02/2010	8.19.03	Dione/Titan	-18"	4.8	17.2	14/03/2010	0.40.06	Dione/Titan	13"	48.5	-46.9	19/04/					



Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S
24/04/2010	8.50.46	Dione/Titan	-7"	-45.2	48.1	09/06/2010	23.19.08	Tethys/Titan	-4"	8.8	-25.0	21/07/2010	6.26.57	Dione/Rhea	-5"	-29.0	26.1
24/04/2010	15.30.33	Tethys/Dione	-0"	7.3	27.1	10/06/2010	2.36.00	Rhea/Titan	-3"	-26.4	-9.7	21/07/2010	15.14.27	Tethys/Dione	5"	50.1	36.3
24/04/2010	19.15.41	Tethys/Dione	0"	44.2	-13.1	10/06/2010	7.32.07	Tethys/Dione	2"	-39.8	41.0	22/07/2010	18.44.15	Tethys/Dione	-4"	28.4	-0.7
25/04/2010	7.22.04	Tethys/Dione	2"	-40.1	33.2	10/06/2010	16.45.59	Tethys/Rhea	-3"	48.3	19.8	23/07/2010	1.16.37	Dione/Rhea	6"	-38.7	-22.2
25/04/2010	13.07.14	Dione/Rhea	-3"	-18.3	51.7	10/06/2010	20.36.23	Tethys/Titan	-7"	36.5	-15.8	23/07/2010	10.34.08	Tethys/Rhea	6"	16.6	66.1
26/04/2010	11.38.10	Tethys/Rhea	-4"	-31.9	60.9	11/06/2010	11.34.11	Tethys/Dione	-1"	-0.2	70.5	23/07/2010	22.35.06	Tethys/Dione	2"	-14.3	-27.3
26/04/2010	13.45.34	Tethys/Dione	-4"	-10.7	46.0	11/06/2010	12.31.37	Rhea/Titan	-6"	10.0	64.8	24/07/2010	21.52.18	Dione/Rhea	-3"	-7.2	-25.2
28/04/2010	0.51.03	Tethys/Rhea	3"	23.3	-29.3	12/06/2010	4.01.46	Dione/Rhea	3"	-39.1	3.5	25/07/2010	1.22.57	Tethys/Rhea	-2"	-40.3	-22.0
28/04/2010	17.27.38	Dione/Rhea	4"	31.2	6.3	12/06/2010	6.34.34	Tethys/Rhea	3"	-43.7	30.3	25/07/2010	21.28.14	Tethys/Rhea	-3"	-3.0	-23.4
28/04/2010	20.47.42	Tethys/Dione	-3"	50.9	-24.9	13/06/2010	13.41.40	Tethys/Dione	2"	24.0	53.8	26/07/2010	0.42.20	Tethys/Dione	-3"	-35.9	-25.6
30/04/2010	0.59.31	Tethys/Dione	1"	20.3	-27.9	14/06/2010	17.53.07	Tethys/Dione	-3"	50.8	8.4	27/07/2010	5.02.57	Tethys/Dione	5"	-37.9	10.0
30/04/2010	12.15.35	Dione/Rhea	-5"	-23.4	59.3	15/06/2010	8.28.45	Dione/Rhea	-2"	-30.2	51.3	27/07/2010	13.01.33	Tethys/Rhea	5"	42.3	58.4
30/04/2010	22.58.03	Rhea/Titan	9"	39.6	-33.0	17/06/2010	0.58.01	Tethys/Dione	-2"	-14.5	-20.3	27/07/2010	13.06.08	Dione/Titan	-10"	42.8	57.8
01/05/2010	15.44.19	Dione/Titan	8"	15.2	25.8	17/06/2010	4.40.21	Dione/Rhea	4"	-43.8	9.8	27/07/2010	23.14.38	Rhea/Titan	-13"	-23.8	-29.0
02/05/2010	3.09.18	Tethys/Dione	-3"	-5.3	-10.5	17/06/2010	10.01.09	Tethys/Rhea	4"	-13.7	66.1	28/07/2010	2.01.43	Dione/Rhea	6"	-44.5	-18.3
02/05/2010	8.11.15	Dione/Rhea	3"	-44.9	43.6	17/06/2010	16.19.57	Dione/Titan	7"	48.3	25.0	28/07/2010	7.51.52	Tethys/Titan	-11"	-10.3	40.8
03/05/2010	4.18.35	Tethys/Rhea	4"	-18.4	1.7	17/06/2010	21.54.38	Tethys/Titan	6"	18.6	-22.2	29/07/2010	3.09.20	Dione/Titan	-9"	-46.0	-9.3
03/05/2010	7.01.55	Tethys/Dione	4"	-41.2	31.3	18/06/2010	8.18.14	Tethys/Dione	-0"	-30.1	49.4	29/07/2010	12.08.05	Tethys/Dione	3"	35.9	64.4
04/05/2010	10.31.01	Tethys/Dione	-3"	-36.3	62.8	18/06/2010	15.13.02	Tethys/Dione	0"	41.5	37.4	29/07/2010	20.50.59	Dione/Rhea	-7"	1.1	-20.5
04/05/2010	17.43.38	Tethys/Rhea	-2"	37.6	4.6	18/06/2010	20.59.29	Rhea/Titan	8"	27.6	-17.7	30/07/2010	3.04.25	Tethys/Rhea	-6"	-46.1	-10.2
05/05/2010	12.48.16	Dione/Rhea	-4"	-14.3	56.6	18/06/2010	23.14.23	Tethys/Rhea	-2"	3.3	-24.6	30/07/2010	17.47.15	Tethys/Dione	-1"	32.8	7.2
05/05/2010	14.10.00	Tethys/Dione	2"	1.1	43.6	18/06/2010	23.27.16	Dione/Rhea	-4"	1.1	-24.5	31/07/2010	17.04.08	Dione/Rhea	4"	38.6	14.7
07/05/2010	6.47.23	Tethys/Rhea	4"	-41.3	29.4	19/06/2010	0.46.47	Tethys/Dione	2"	-13.9	-21.1	01/08/2010	16.06.32	Tethys/Rhea	5"	45.1	25.1
07/05/2010	15.32.22	Tethys/Dione	-2"	17.6	29.0	20/06/2010	7.35.00	Tethys/Dione	-3"	-35.1	41.4	01/08/2010	18.44.26	Tethys/Dione	4"	21.9	-2.6
08/05/2010	8.41.12	Rhea/Titan	-6"	-44.3	49.9	22/06/2010	3.30.49	Dione/Rhea	2"	-40.0	-1.0	03/08/2010	5.37.31	Tethys/Rhea	-5"	-29.7	15.2
08/05/2010	20.42.14	Tethys/Dione	3"	50.0	-21.9	22/06/2010	14.39.16	Tethys/Dione	-3"	38.9	43.8	03/08/2010	21.35.18	Dione/Rhea	-6"	-11.0	-26.1
08/05/2010	22.40.33	Dione/Titan	-7"	37.5	-30.4	23/06/2010	18.49.40	Tethys/Dione	1"	44.1	0.0	04/08/2010	1.53.51	Tethys/Dione	5"	-45.7	-20.0
09/05/2010	3.15.12	Dione/Rhea	-3"	-11.5	-8.0	24/06/2010	0.11.35	Dione/Rhea	-4"	-11.1	-23.3	04/08/2010	6.28.52	Rhea/Titan	11"	-20.7	24.5
09/05/2010	20.20.51	Tethys/Titan	-8"	50.7	-19.1	24/06/2010	2.46.08	Tethys/Rhea	-4"	-35.8	-8.4	05/08/2010	5.56.18	Tethys/Dione	-2"	-25.6	18.3
09/05/2010	20.46.28	Tethys/Rhea	-4"	49.6	-22.1	25/06/2010	16.23.10	Tethys/Rhea	2"	50.2	24.7	05/08/2010	11.00.32	Dione/Titan	13"	29.0	60.7
09/05/2010	23.15.20	Rhea/Titan	-4"	31.4	-30.5	25/06/2010	19.00.45	Dione/Rhea	4"	41.7	-1.5	05/08/2010	14.04.24	Tethys/Titan	12"	49.4	40.2
10/05/2010	14.58.53	Rhea/Titan	-5"	13.7	35.7	25/06/2010	21.01.57	Tethys/Dione	-3"	22.5	-17.8	05/08/2010	16.30.48	Dione/Rhea	7"	40.5	19.9
11/05/2010	3.44.44	Tethys/Dione	2"	-18.1	-2.1	26/06/2010	4.33.27	Rhea/Titan	-9"	-45.0	8.3	07/08/2010	8.05.06	Tethys/Dione	3"	-0.7	41.7
11/05/2010	11.52.53	Tethys/Rhea	1"	-19.6	64.1	26/06/2010	6.18.45	Tethys/Titan	-8"	-41.2	27.0	07/08/2010	12.17.11	Dione/Rhea	-4"	41.3	61.4
11/05/2010	22.01.49	Tethys/Rhea	1"	41.3	-28.1	26/06/2010	16.40.25	Dione/Titan	-8"	50.7	21.6	08/08/2010	9.14.25	Tethys/Rhea	-6"	12.2	53.0
12/05/2010	7.58.14	Tethys/Rhea	3"	-44.9	43.3	27/06/2010	0.57.06	Tethys/Dione	4"	-21.1	-20.6	08/08/2010	12.17.22	Tethys/Dione	-5"	41.7	61.1
12/05/2010	8.09.34	Dione/Rhea	3"	-44.7	45.3	28/06/2010	4.27.02	Tethys/Dione	-3"	-45.1	7.1	09/08/2010	22.29.44	Tethys/Rhea	4"	-24.5	-31.3
12/05/2010	8.16.54	Tethys/Dione	-0"	-44.5	46.6	28/06/2010	5.15.20	Tethys/Rhea	-4"	-44.8	15.4	10/08/2010	17.09.07	Dione/Rhea	6"	32.2	11.8
13/05/2010	23.07.53	Tethys/Rhea	-3"	30.0	-29.5	28/06/2010	22.17.19	Dione/Rhea	-2"	6.7	-23.4	10/08/2010	19.23.31	Tethys/Dione	-4"	8.8	-11.4
14/05/2010	10.11.15	Tethys/Dione	3"	-33.5	63.7	29/06/2010	8.06.21	Tethys/Dione	2"	-25.7	46.7	12/08/2010	2.44.35	Tethys/Dione	1"	-45.7	-15.7
15/05/2010	14.02.52	Tethys/Dione	-3"	7.2	46.6	30/06/2010	19.17.09	Tethys/Rhea	4"	36.7	-4.7	12/08/2010	9.38.46	Tethys/Dione	1"	19.0	55.6
15/05/2010	22.32.22	Dione/Rhea	3"	34.5	-28.5	30/06/2010	19.45.54	Dione/Rhea	5"	32.2	-8.9	12/08/2010	11.57.17	Tethys/Rhea	-7"	40.9	61.6
16/05/2010	13.06.54	Tethys/Rhea	4"	-2.0	56.1	01/07/2010	9.23.26	Tethys/Dione	-2"	-11.2	59.9	12/08/2010	12.06.56	Dione/Rhea	-8"	42.1	60.9
16/05/2010	17.27.51	Tethys/Dione	3"	42.3	9.3	02/07/2010	11.44.26	Tethys/Rhea	-1"	15.7	70.1	12/08/2010	18.22.48	Tethys/Titan	-12"	18.4	-1.1
16/05/2010	21.32.59	Tethys/Titan	6"	42.4	-25.0	02/07/2010	14.29.56	Dione/Rhea	-4"	42.5	45.7	12/08/2010	18.32.28	Dione/Titan	-14"	16.7	-3.2
17/05/2010	21.05.17	Dione/Titan	7"	45.3	-22.3	02/07/2010	14.41.24	Tethys/Dione	3"	43.9	43.6	12/08/2010	19.13.46	Tethys/Dione	2"	9.2	-10.4
17/05/2010	21.15.05	Tethys/Dione	-1"	44.2	-23.2	02/07/2010	17.02.18	Tethys/Rhea	-1"	49.9	17.7	13/08/2010	22.35.45	Tethys/Titan	-12"	-27.9	-32.8
18/05/2010	2.57.27	Rhea/Titan	7"	-14.7	-9.0	03/07/2010	7.17.04	Tethys/Rhea	-3"	-31.0	37.3	14/08/2010	2.02.18	Tethys/Dione	-5"	-46.8	-22.0
19/05/2010	2.11.22	Tethys/Rhea	-3"	-7.2	-15.3	03/07/2010	10.48.36	Rhea/Titan	8"	6.1	70.1	14/08/2010	4.59.20	Rhea/Titan	-14"	-29.9	6.5
19/05/2010	3.29.19	Dione/Rhea	-3"	-20.9	-3.6	03/07/2010	22.05.17	Dione/Titan	8"	5.4	-23.1	14/08/2010	7.43.15	Dione/Rhea	5"	-0.4	36.6
19/05/2010	22.59.12	Tethys/Dione	2"	27.4	-28.1	04/07/2010	13.15.07	Tethys/Titan	8"	32.7	58.8	15/08/2010	1.56.34	Tethys/Rhea	7"	-46.9	-22.9
20/05/2010	15.36.36	Tethys/Rhea	3"	27.7	30.2	04/07/2010	16.04.44	Dione/Rhea	1"	50.4	28.1	16/08/2010	9.07.44	Tethys/Dione	-5"	15.9	50.4
21/05/2010	3.45.55	Tethys/Dione	-3"	-25.0	-0.3	04/07/2010	21.43.36	Tethys/Rhea	4"	8.6	-21.6	16/08/2010	16.03.47	Tethys/Rhea	-4"	38.5	22.5
22/05/2010	17.46.34	Dione/Rhea	-3"	47.1	7.0	04/07/2010	21.45.48	Tethys/Dione	3"	8.2	-21.9	17/08/2010	12.41.40	Dione/Rhea	-6"	46.9	55.9
23/05/2010	10.47.24	Tethys/Dione	-2"	-22.5	68.1	04/07/2010	22.23.28	Dione/Rhea	1"	1.5	-24.1	17/08/2010	13.18.58	Tethys/Dione	2"	48.7	50.9
24/05/2010	15.40.32	Tethys/Dione	0"	31.1	30.0	05/07/2010	16.36.03	Dione/Rhea	2"	50.3	22.3	19/08/2010	4.25.59	Tethys/Rhea	7"	-32.4	0.1
25/05/2010	4.15.32	Dione/Titan	-7"	-31.9	4.7	06/07/2010	2.15.52	Tethys/Dione	-1"	-37.8	-13.3	19/08/2010	15.32.13	Tethys/Dione	-4"	41.1	27.6
25/05/2010	5.24.18	Tethys/Titan	-7"	-40.2	16.7	07/07/2010	15.18.34	Dione/Rhea	-5"	48.9	36.6	20/08/2010	19.27.45	Tethys/Dione	6"	1.3	-14.8
25/05/2010	19.06.20	Tethys/Rhea	4"	51.0	-5.8	08/07/2010	4.14.01	Tethys/Dione	3"	-45.5	4.2	21/08/2010	0.50.18	Tethys/Titan	14"	-46.3	-31.6
25/05/2010	22.48.31	Dione/Rhea	3"	25.1	-26.8	09/07/2010	8.07.14	Tethys/Dione	-4"	-19.5	46.0	21/08/2010	3.06.37	Dione/Rhea	-6"	-41.8	-14.3
26/05/2010	17.20.27	Tethys/Dione	-3"	46.1	12.1	09/07/2010	10.06.11	Dione/Rhea	5"	2.4	65.4	21/08/2010	10.57.04	Rhea/Titan	17"	36.8	59.8
27/05/2010	8.20.42	Tethys/Rhea	-2"	-40.3	49.2	10/07/2010	1.02.00	Tethys/Rhea	4"	-29.9	-21.4	21/08/2010	17.22.18	Dione/Titan	14"	23.2	6.8
27/05/2010	21.01.16	Tethys/Dione	3"	40.9	-20.1	10/07/2010	11.33.11	Tethys/Dione	4"	18.9	69.9	21/08/2010	18.30.13	Tethys/Rhea	-8"	11.1	-5.5
29/05/2010	0.30.23	Tethys/Dione	-3"	4.4	-23.8	11/07/2010	8.33.25	Dione/Rhea	-2"	-13.6	50.5	21/08/2010	22.58.10	Tethys/Dione	-6"	-35.8	-36.0
29/05/2010	13.11.16	Dione/Rhea	3"	8.0	57.4	11/07/2010	14.21.04	Tethys/Rhea	-3"	45.1	47.0	23/08/2010	2.38.10	Tethys/Dione	4"	-43.9	-19.1
30/05/2010	4.20.51	Tethys/Dione	1"	-35.3	6.0	11/07/2010	15.20.29	Tethys/Dione	-2"	49.6	36.0	24/08/2010	7.11.13	Tethys/Rhea	6"	-0.1	29.0
01/06/2010	6.27.23																

Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S
05/09/2010	3.42.20	Rhea/Titan	14"	-30.6	-11.5	11/10/2010	8.04.48	Tethys/Dione	4"	35.6	27.0	19/11/2010	13.36.38	Dione/Rhea	-11"	4.4	18.4
05/09/2010	10.56.04	Dione/Titan	13"	42.6	54.6	12/10/2010	17.58.38	Tethys/Rhea	13"	-18.5	-16.3	20/11/2010	8.18.53	Tethys/Rhea	-15"	44.7	18.3
05/09/2010	21.58.01	Dione/Titan	10"	-35.3	-38.7	12/10/2010	21.02.54	Dione/Rhea	14"	-45.8	-47.2	20/11/2010	11.49.03	Tethys/Dione	-13"	22.6	27.2
06/09/2010	11.43.13	Tethys/Dione	4"	46.7	53.7	13/10/2010	10.17.33	Tethys/Dione	-7"	46.3	39.3	21/11/2010	15.15.48	Tethys/Dione	12"	-15.6	4.3
06/09/2010	16.26.24	Tethys/Titan	16"	22.6	12.4	14/10/2010	14.12.00	Tethys/Dione	10"	21.6	23.1	21/11/2010	22.13.28	Tethys/Rhea	10"	-41.6	-66.1
06/09/2010	17.22.12	Tethys/Rhea	9"	12.7	2.3	14/10/2010	15.48.17	Dione/Rhea	-14"	4.5	7.3	22/11/2010	18.35.43	Dione/Rhea	14"	-47.1	-31.3
06/09/2010	22.52.03	Dione/Titan	15"	-42.6	-41.6	15/10/2010	7.12.04	Tethys/Rhea	-10"	29.8	17.9	22/11/2010	19.20.31	Tethys/Dione	-7"	-50.4	-39.6
06/09/2010	23.10.23	Dione/Rhea	6"	-44.3	-41.8	15/10/2010	17.42.25	Tethys/Dione	-10"	-17.5	-14.1	24/11/2010	10.47.28	Tethys/Rhea	-16"	29.9	27.4
07/09/2010	16.32.03	Tethys/Dione	-7"	21.0	11.1	15/10/2010	22.21.19	Tethys/Titan	-23"	-49.8	-55.8	24/11/2010	13.37.45	Dione/Rhea	-19"	1.0	17.5
08/09/2010	7.05.30	Tethys/Rhea	-5"	7.7	25.1	16/10/2010	14.43.04	Dione/Rhea	5"	14.9	17.6	24/11/2010	21.29.27	Tethys/Dione	8"	-45.7	-61.6
08/09/2010	18.44.31	Dione/Rhea	-11"	-3.8	-13.6	16/10/2010	19.08.12	Tethys/Titan	-17"	-32.8	-30.1	24/11/2010	21.29.59	Rhea/Titan	36"	-45.7	-61.6
09/09/2010	23.35.53	Tethys/Dione	-6"	-47.0	-42.6	16/10/2010	20.35.41	Tethys/Rhea	11"	-44.6	-44.7	25/11/2010	16.24.37	Dione/Titan	33"	-30.4	-7.8
10/09/2010	13.45.44	Dione/Rhea	9"	43.4	39.1	16/10/2010	20.56.34	Rhea/Titan	-29"	-46.6	-47.7	26/11/2010	1.38.42	Tethys/Dione	-13"	-3.9	-50.5
10/09/2010	19.54.26	Tethys/Rhea	9"	-18.2	-25.8	16/10/2010	21.22.55	Tethys/Dione	7"	-48.5	-51.1	26/11/2010	9.03.55	Dione/Rhea	13"	41.3	21.7
11/09/2010	4.30.06	Tethys/Dione	2"	-19.2	-3.9	16/10/2010	21.50.15	Dione/Titan	-26"	-49.6	-53.9	27/11/2010	0.50.10	Tethys/Rhea	17"	-12.5	-58.7
13/09/2010	6.12.13	Tethys/Dione	-6"	1.1	14.5	17/10/2010	1.29.46	Tethys/Titan	-21"	-29.9	-43.2	27/11/2010	0.50.20	Tethys/Dione	14"	32.1	-13.0
13/09/2010	9.58.56	Tethys/Rhea	-10"	38.9	48.8	17/10/2010	7.46.32	Dione/Rhea	3"	35.7	22.7	28/11/2010	8.44.57	Tethys/Dione	-10"	42.1	19.5
13/09/2010	18.34.17	Dione/Rhea	-6"	-5.5	-13.4	17/10/2010	15.36.49	Dione/Rhea	4"	4.6	8.4	29/11/2010	13.21.36	Tethys/Rhea	-11"	0.6	18.6
13/09/2010	20.15.57	Tethys/Titan	-17"	-23.9	-30.1	18/10/2010	22.48.17	Tethys/Dione	-4"	-48.7	-57.8	29/11/2010	14.05.37	Dione/Rhea	-14"	-8.1	13.5
14/09/2010	8.02.52	Dione/Titan	-21"	21.5	33.6	19/10/2010	10.26.56	Tethys/Rhea	-14"	45.7	37.5	29/11/2010	17.20.34	Tethys/Dione	3"	-41.3	-17.9
14/09/2010	9.54.12	Tethys/Dione	8"	38.7	48.0	19/10/2010	16.40.27	Dione/Rhea	-14"	-8.9	-3.4	29/11/2010	20.26.23	Tethys/Dione	2"	-49.9	-51.9
14/09/2010	14.52.31	Tethys/Titan	-13"	33.0	26.8	20/10/2010	3.59.06	Tethys/Dione	9"	-0.5	-17.6	30/11/2010	9.01.30	Tethys/Dione	4"	40.1	20.7
15/09/2010	0.05.59	Tethys/Titan	-17"	-48.3	-43.0	21/10/2010	11.29.11	Dione/Rhea	15"	41.0	36.7	01/12/2010	3.18.47	Tethys/Rhea	15"	17.4	-33.1
15/09/2010	1.03.14	Rhea/Titan	-21"	-46.0	-37.8	22/10/2010	0.13.23	Tethys/Rhea	12"	-39.1	-54.7	01/12/2010	9.16.14	Dione/Rhea	20"	38.3	21.8
15/09/2010	4.03.54	Tethys/Rhea	3"	-21.5	-9.7	22/10/2010	11.04.12	Tethys/Dione	9"	42.9	36.9	01/12/2010	15.22.46	Tethys/Dione	-11"	-23.6	2.4
15/09/2010	5.20.43	Tethys/Rhea	3"	-7.7	4.7	23/10/2010	8.59.30	Dione/Rhea	-6"	44.6	30.2	02/12/2010	8.22.56	Rhea/Titan	-28"	42.5	16.4
15/09/2010	13.24.20	Tethys/Dione	-8"	43.5	40.4	23/10/2010	13.32.46	Tethys/Rhea	-9"	22.6	25.6	03/12/2010	0.18.47	Dione/Titan	-35"	-14.4	-64.3
15/09/2010	14.25.44	Dione/Rhea	11"	36.3	31.0	23/10/2010	15.38.30	Tethys/Dione	-4"	0.5	6.4	03/12/2010	4.27.25	Dione/Rhea	-14"	29.6	-20.8
15/09/2010	22.10.49	Tethys/Rhea	6"	-41.9	-43.4	24/10/2010	2.04.23	Rhea/Titan	30"	-19.9	-39.2	03/12/2010	16.11.37	Tethys/Titan	-34"	-33.2	-5.9
16/09/2010	17.16.06	Tethys/Dione	4"	7.1	0.4	24/10/2010	3.06.02	Dione/Titan	27"	-8.7	-28.2	03/12/2010	17.17.20	Tethys/Rhea	-18"	-42.9	-17.4
17/09/2010	9.18.10	Dione/Rhea	-10"	35.1	43.4	25/10/2010	17.34.39	Tethys/Dione	8"	-22.7	-15.3	03/12/2010	22.27.01	Tethys/Dione	-13"	-33.4	-68.9
17/09/2010	12.27.48	Tethys/Rhea	-9"	46.8	46.2	26/10/2010	2.53.49	Tethys/Rhea	14"	-9.7	-30.9	03/12/2010	23.52.04	Rhea/Titan	-17"	-18.7	-67.6
18/09/2010	19.24.55	Tethys/Dione	-5"	-18.2	-23.8	26/10/2010	12.18.25	Dione/Rhea	14"	32.6	32.3	04/12/2010	14.29.48	Rhea/Titan	-23"	-16.0	9.9
19/09/2010	23.44.11	Tethys/Dione	8"	-48.6	-45.9	26/10/2010	21.26.58	Tethys/Dione	-11"	-50.3	-54.8	05/12/2010	2.40.57	Tethys/Dione	7"	13.2	-40.7
20/09/2010	2.28.22	Tethys/Rhea	11"	-34.4	-27.2	28/10/2010	0.53.11	Tethys/Dione	11"	-30.0	-51.5	06/12/2010	6.46.00	Tethys/Rhea	14"	43.9	2.7
20/09/2010	13.52.59	Dione/Rhea	6"	38.2	34.4	28/10/2010	7.05.27	Dione/Rhea	-16"	34.9	13.7	06/12/2010	9.32.31	Dione/Rhea	14"	34.1	22.2
21/09/2010	14.24.31	Dione/Titan	18"	33.3	29.1	28/10/2010	16.55.44	Tethys/Rhea	-13"	-17.7	-8.9	07/12/2010	4.52.13	Tethys/Dione	-9"	34.9	-16.9
22/09/2010	2.51.29	Tethys/Titan	20"	-29.8	-23.9	29/10/2010	4.41.57	Tethys/Dione	-7"	12.3	-11.5	07/12/2010	20.00.52	Tethys/Rhea	-14"	-49.9	-47.5
22/09/2010	6.28.39	Rhea/Titan	23"	9.4	15.7	30/10/2010	3.55.57	Dione/Rhea	7"	4.6	-20.2	08/12/2010	4.50.47	Dione/Rhea	-21"	35.1	-17.3
22/09/2010	6.49.56	Tethys/Dione	6"	13.3	19.5	30/10/2010	7.22.40	Tethys/Rhea	7"	37.9	15.9	08/12/2010	8.45.18	Tethys/Dione	14"	38.7	17.8
22/09/2010	10.04.14	Dione/Rhea	-12"	42.7	46.1	30/10/2010	21.45.25	Tethys/Rhea	5"	-50.1	-58.1	09/12/2010	12.15.11	Tethys/Dione	-14"	5.7	23.2
22/09/2010	15.54.33	Tethys/Rhea	-8"	17.9	13.1	31/10/2010	2.49.42	Tethys/Rhea	7"	-7.4	-32.6	09/12/2010	23.58.09	Dione/Rhea	15"	-13.7	-67.9
23/09/2010	12.35.48	Tethys/Dione	-2"	44.9	43.1	31/10/2010	6.30.26	Tethys/Dione	5"	31.4	7.4	10/12/2010	15.55.35	Tethys/Dione	10"	-34.8	-2.9
24/09/2010	4.57.29	Dione/Rhea	11"	-6.4	-0.8	31/10/2010	11.11.36	Rhea/Titan	-27"	38.7	33.8	10/12/2010	17.50.20	Tethys/Titan	29"	-49.3	-23.3
24/09/2010	5.11.04	Tethys/Rhea	8"	-3.6	1.4	31/10/2010	15.17.51	Dione/Titan	-21"	-0.9	7.8	11/12/2010	8.06.12	Tethys/Titan	22"	41.1	13.0
25/09/2010	13.27.06	Tethys/Dione	7"	39.0	36.3	31/10/2010	23.55.38	Dione/Titan	-17"	-37.0	-59.4	11/12/2010	21.16.20	Tethys/Titan	30"	-40.0	-60.4
26/09/2010	17.09.31	Tethys/Dione	-9"	1.7	-1.3	01/11/2010	11.15.36	Tethys/Dione	-11"	37.8	33.4	11/12/2010	22.18.25	Dione/Titan	32"	-30.2	-68.7
26/09/2010	18.56.34	Tethys/Rhea	-11"	-18.4	-21.7	01/11/2010	14.15.58	Tethys/Titan	-28"	9.2	17.1	12/12/2010	2.33.04	Rhea/Titan	35"	16.1	-43.2
27/09/2010	9.03.39	Dione/Rhea	-6"	37.5	38.7	01/11/2010	19.23.40	Tethys/Rhea	-14"	-43.5	-37.0	12/12/2010	17.23.39	Tethys/Dione	-6"	-47.6	-18.5
27/09/2010	20.36.32	Tethys/Dione	8"	-35.5	-38.2	02/11/2010	3.53.52	Dione/Titan	-26"	6.0	-21.2	12/12/2010	23.34.58	Tethys/Rhea	-16"	-16.0	-70.2
29/09/2010	0.40.19	Tethys/Dione	-5"	-44.5	-44.7	02/11/2010	7.54.29	Dione/Rhea	-14"	42.1	19.6	13/12/2010	4.56.24	Dione/Rhea	-13"	37.8	-17.0
29/09/2010	5.44.56	Dione/Rhea	13"	5.7	6.4	03/11/2010	18.19.10	Tethys/Dione	-10"	-35.6	-25.6	13/12/2010	22.30.04	Tethys/Dione	13"	-27.0	-69.7
29/09/2010	8.48.39	Tethys/Rhea	10"	36.4	36.3	04/11/2010	2.46.06	Dione/Rhea	17"	-5.5	-34.1	14/12/2010	13.07.50	Tethys/Rhea	12"	-7.8	19.1
29/09/2010	14.40.17	Rhea/Titan	-23"	26.2	23.7	04/11/2010	9.26.43	Tethys/Rhea	15"	45.1	29.1	15/12/2010	2.05.11	Tethys/Dione	-15"	13.1	-48.7
30/09/2010	12.04.09	Tethys/Titan	-22"	45.1	43.0	04/11/2010	23.17.31	Tethys/Dione	4"	-40.5	-63.2	16/12/2010	5.33.59	Tethys/Dione	13"	42.0	-10.8
30/09/2010	15.03.11	Dione/Titan	-24"	21.7	19.5	05/11/2010	22.59.56	Dione/Rhea	-9"	-42.4	-63.9	16/12/2010	19.24.06	Dione/Rhea	-17"	-50.4	-40.4
30/09/2010	22.17.06	Tethys/Rhea	-7"	-47.7	-49.8	06/11/2010	22.22.57	Tethys/Rhea	-10"	-46.2	-63.2	17/12/2010	2.05.19	Tethys/Rhea	-18"	14.4	-48.9
01/10/2010	0.32.01	Dione/Rhea	-12"	-44.7	-46.2	07/11/2010	0.55.26	Tethys/Dione	-9"	-23.9	-53.6	17/12/2010	10.09.26	Tethys/Dione	-6"	22.4	23.3
01/10/2010	2.49.43	Tethys/Dione	6"	-25.3	-26.2	08/11/2010	4.36.31	Tethys/Dione	12"	17.2	-14.5	19/12/2010	1.54.18	Tethys/Titan	-35"	13.7	-51.1
02/10/2010	7.00.44	Tethys/Dione	-9"	21.0	19.1	08/11/2010	11.59.09	Tethys/Rhea	13"	28.2	29.6	19/12/2010	6.45.17	Dione/Titan	-39"	43.6	1.1
03/10/2010	11.24.30	Tethys/Rhea	11"	46.4	43.7	08/11/2010	16.53.34	Tethys/Titan	23"	-24.5	-10.7	19/12/2010	11.25.39	Rhea/Titan	-43"	7.8	24.5
04/10/2010	4.01.39	Dione/Rhea	5"	-10.7	-13.9	09/11/2010	3.08.21	Tethys/Titan	18"	2.1	-31.0	19/12/2010	12.03.14	Tethys/Dione	10"	1.2	23.6
04/10/2010	14.07.27	Tethys/Dione	-7"	28.5	27.2	09/11/2010	3.30.02	Dione/Rhea	14"	6.0	-27.0	19/12/2010	16.06.31	Tethys/Rhea	18"	-41.6	-4.6
05/10/2010	21.58.08	Tethys/Dione	2"	-47.8	-50.5	09/11/2010	8.06.31	Tethys/Dione	-12"	44.2	19.4	20/12/2010	0.15.13	Dione/Rhea	12"	-3.5	-66.9
06/10/2010	1.23.15	Dione/Rhea	-13"	-36.5	-41.3	09/11/2010	20.05.27	Tethys/Titan	26"	-49.9	-46.0	20/12/2010	15.54.27	Tethys/Dione	-15"	-40.4	-2.0
06/10/2010	1.28.14	Tethys/Rhea	-12"	-35.7	-40.6	10/11/2010	6.28.20	Rhea/Titan	27"</								

Date	time	Moons	Dist."	h	h S	Date	time	Moons	Dist."	h	h S
30/12/2010	10.22.43	Dione/Rhea	-19"	11.6	23.8	31/12/2010	19.16.52	Tethys/Dione	-11"	-46.2	-37.5
30/12/2010	11.07.19	Tethys/Rhea	-16"	3.7	24.9						

Date = data  
 Time = orario  
 Moons = lune coinvolte  
 Dist = distanza in secondi  
 H = altitudine di Saturno sull'orizzonte  
 H S = altitudine del Sole sull'orizzonte

TEMPI IN T.U.

Date in the format dd/mm/yyyy  
 Dist = distance in seconds  
 H = altitude of Saturn above the horizon  
 H S = altitude of the Sun above the horizon

TIMES IN U.T.

Valori negativi delle distanze indicano che il 2° satellite transita a nord dell'altro  
 Negative values of the distances show that the 2nd satellite transits to north of the other

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# OCCULTAZIONI TRA I SATELLITI DI SATURNO

## OCCULTAT. BETWEEN THE SATELLITES OF SATURN

Year	M	D	h	m	s	Event Type	Ph	Dur	dMag	%Ill	Sep	PA	MinD	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	
2010	2	12	16	25	6	(I) ecl (II)	E	218	0.0	97.9	23.8	81	0.061	16	23	17				16	25	6				16	26	55				
2010	2	27	17	39	55	(I) ecl (II)	P	665	0.2	85.3	21.8	80	0.046	17	34	23	17	35	50		17	39	55				17	44	1	17	45	28
2010	4	19	21	49	49	(II) occ (I)	T	676	0.5	61.2	12.0	92	0.006				21	44	11	21	49	21	21	49	49	21	50	17	21	55	27	
2010	4	20	3	49	34	(II) occ (I)	P	191	0.5	65.1	28.0	264	0.015				3	47	58		3	49	34				3	51	9			
2010	4	24	15	28	24	(IV) occ (III)	P	1922	0.5	63.9	38.0	88	0.038				15	12	23		15	28	24				15	44	25			
2010	5	5	0	37	40	(II) ecl (I)	E	231	0.0	98.9	4.9	105	0.063	0	35	45				0	37	40								0	39	36
2010	5	27	7	8	21	(III) occ (II)	P	215	0.1	89.1	35.9	266	0.071				7	6	33		7	8	21				7	10	8			
2010	5	31	22	9	7	(I) occ (IV)	P	197	0.0	97.2	4.7	65	0.095				22	7	28		22	9	7				22	10	45			
2010	6	4	7	2	34	(II) ecl (I)	P	759	0.3	73.5	14.8	261	0.044	6	56	14	6	57	35		7	2	34				7	7	32	7	8	53
2010	6	5	23	31	54	(III) occ (IV)	P	353	0.1	90.1	43.3	267	0.112				23	28	58		23	31	54				23	34	51			
2010	6	11	9	39	6	(III) occ (II)	P	105	0.0	97.5	35.0	266	0.099				9	38	14		9	39	6				9	39	59			
2010	6	15	20	2	18	(II) occ (III)	P	904	0.1	89.6	1.6	315	0.071				19	54	46		20	2	18				20	9	50			
2010	6	18	8	17	22	(IV) occ (III)	P	956	0.3	78.9	38.2	88	0.075				8	9	25		8	17	22				8	25	20			
2010	7	1	5	26	29	(II) occ (III)	A	313	0.2	81.9	33.6	85	0.013				5	23	53	5	25	35	5	26	29	5	27	23	5	29	5	

Ore in T.U.

Legenda :

Data nel formato mese/giorno, un asterisco indica che le lune si avvicinano ma non si occultano

Event type : tipo di evento, eclissi o occultazione

Ph : fenomeno, M=mancato, E=eclisse penombrale, P=eclisse/occultazione parziale, T=eclisse/occultazione totale, A=eclisse/occultazione anulare

Durn : durata in secondi

dMag : caduta di luce in magnitudini

%ill : cambio in illuminazione, rispetto alla illuminazione intera, della luna rimanente (occultazione) o di entrambe (eclissi)

Sep : distanza in " tra satellite occultato/eclissato e centro del pianeta

Pa : angolo di posizione tra satellite occultato/eclissato e pianeta

MinSep : distanza minima tra i centri delle lune o tra la luna e l'ombra

T1-T7 : inizio/fine della fase di contatto con la penombra

T2-T6 : inizio/fine della fase di contatto con l'ombra o tra i lembi delle lune

T3-T5 : inizio/fine della fase di totalità

Tmax : tempo di metà evento

Satelliti :

I = Mimas

II = Enceladus

III = Tethys

IV = Dione

V = Rhea

VI = Titan

VII = Hyperion

Times in T.U.

Date in the format month/day, an asterisk shows that the moons are near but they don't occult

Event type : eclipse or occultation

Ph : phenomenon, M=missed, E=penumbral eclipse, P=partial eclipse/occultation, T=total eclipse/occultation, A=annular eclipse/occultation

Durn : duration in seconds

dMag : difference magnitude

%ill : defect of illumination, respect to integer

Sep : distance in " between the satellite and the center of the planet

Pa : position angle between the satellite and the center of the planet

MinD : least distance between the satellies

T1-T7 : penumbral phase begins/ends

T2-T6 : umbra phase begins/ends

T3-T5 : totalità phase begins/ends

Tmax : middle time of the event

Satellites :

I = Mimas

II = Enceladus

III = Tethys

IV = Dione

V = Rhea

VI = Titan

VII = Hyperion

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# CONGIUNZIONI ED ELONGAZIONI DEI SATELLITI DI SATURNO

## CONJUNCTIONS AND ELONGATIONS OF THE SATELLITES OF SATURN

Tethys Congiunzione superiore - Tethys Superior conjunction

Date	Time	h	h S
02/01/2010	15.11.05	-42.8	5.6
04/01/2010	12.29.31	-20.4	23.2
06/01/2010	9.47.54	7.9	22.3
08/01/2010	7.06.15	34.3	3.5
10/01/2010	4.24.34	48.2	-24.5
12/01/2010	1.42.50	37.2	-53.9
13/01/2010	23.01.03	11.7	-69.0
15/01/2010	20.19.14	-16.9	-46.5
17/01/2010	17.37.23	-40.6	-16.4
19/01/2010	14.55.29	-46.6	10.8
21/01/2010	12.13.33	-28.9	27.1
23/01/2010	9.31.34	-0.8	23.4
25/01/2010	6.49.33	26.4	2.4
27/01/2010	4.07.30	46.3	-26.5
29/01/2010	1.25.25	43.4	-54.9
30/01/2010	22.43.17	20.7	-63.9
01/02/2010	20.01.08	-7.7	-39.9
03/02/2010	17.18.56	-33.9	-9.7
05/02/2010	14.36.43	-47.4	17.4
07/02/2010	11.54.27	-36.1	32.4
09/02/2010	9.12.10	-10.5	25.5
11/02/2010	6.29.51	18.1	2.3
13/02/2010	3.47.30	42.0	-27.2
15/02/2010	1.05.07	47.6	-53.7
16/02/2010	22.22.43	29.3	-57.1
18/02/2010	19.40.17	2.0	-32.4
20/02/2010	16.57.51	-26.0	-1.4
22/02/2010	14.15.22	-45.1	25.0
24/02/2010	11.32.53	-41.6	38.6
26/02/2010	8.50.23	-18.9	28.2
28/02/2010	6.07.52	9.6	2.8
02/03/2010	3.25.20	36.0	-26.8
04/03/2010	0.42.47	49.3	-50.5
05/03/2010	22.00.13	37.1	-49.4
07/03/2010	19.17.39	11.1	-24.5
09/03/2010	16.35.05	-17.4	6.0
11/03/2010	13.52.30	-40.4	33.1
13/03/2010	11.09.56	-45.0	45.1
15/03/2010	8.27.21	-26.7	31.0
17/03/2010	5.44.46	1.2	3.8
19/03/2010	3.02.11	28.8	-25.3
21/03/2010	0.19.37	48.2	-45.8
22/03/2010	21.37.03	43.8	-41.4
24/03/2010	18.54.30	20.2	-16.6
26/03/2010	16.11.58	-8.3	13.8
28/03/2010	13.29.26	-33.9	41.1
30/03/2010	10.46.55	-45.9	51.3
01/04/2010	8.04.25	-33.6	33.4
03/04/2010	5.21.56	-7.9	4.9

Date	Time	h	h S
05/04/2010	2.39.29	20.7	-23.2
06/04/2010	23.57.02	44.3	-40.3
08/04/2010	21.14.37	48.7	-33.6
10/04/2010	18.32.14	29.2	-8.9
12/04/2010	15.49.52	1.6	21.3
14/04/2010	13.07.32	-26.0	48.8
16/04/2010	10.25.14	-44.1	56.6
18/04/2010	7.42.57	-39.4	35.0
20/04/2010	5.00.43	-16.5	5.9
22/04/2010	2.18.30	11.9	-20.9
23/04/2010	23.36.20	38.2	-34.9
25/04/2010	20.54.12	50.8	-26.5
27/04/2010	18.12.06	37.5	-1.1
29/04/2010	15.30.02	11.1	28.1
01/05/2010	12.48.00	-17.2	55.7
03/05/2010	10.06.01	-39.6	60.4
05/05/2010	7.24.05	-43.4	35.8
07/05/2010	4.42.10	-25.0	6.5
09/05/2010	2.00.18	2.6	-18.7
10/05/2010	23.18.29	30.2	-30.2
12/05/2010	20.36.42	49.5	-20.3
14/05/2010	17.54.58	44.6	4.4
16/05/2010	15.13.16	20.8	33.9
18/05/2010	12.31.37	-7.7	61.5
20/05/2010	9.50.01	-33.1	62.5
22/05/2010	7.08.27	-44.9	35.5
24/05/2010	4.26.56	-33.0	6.5
26/05/2010	1.45.27	-7.5	-17.3
27/05/2010	23.04.01	20.9	-26.6
29/05/2010	20.22.38	44.7	-15.6
31/05/2010	17.41.17	49.5	9.1
02/06/2010	14.59.59	30.2	38.5
04/06/2010	12.18.43	2.7	65.8
06/06/2010	9.37.30	-24.9	62.6
08/06/2010	6.56.20	-43.3	34.3
10/06/2010	4.15.12	-39.7	5.6
12/06/2010	1.34.06	-17.4	-17.1
13/06/2010	22.53.03	10.8	-24.6
15/06/2010	20.12.02	37.2	-12.6
17/06/2010	17.31.04	50.9	12.3
19/06/2010	14.50.08	38.8	41.7
21/06/2010	12.09.14	12.8	68.2
23/06/2010	9.28.23	-15.5	61.2
25/06/2010	6.47.34	-38.7	32.4
27/06/2010	4.06.47	-44.2	3.9
29/06/2010	1.26.02	-27.1	-18.2
30/06/2010	22.45.20	0.4	-24.5
02/07/2010	20.04.39	27.8	-11.5
04/07/2010	17.24.01	48.1	13.8

Date	Time	h	h S
06/07/2010	14.43.24	45.6	43.1
08/07/2010	12.02.49	22.9	68.2
10/07/2010	9.22.17	-5.4	58.9
12/07/2010	6.41.46	-31.5	29.9
14/07/2010	4.01.17	-45.6	1.5
16/07/2010	1.20.50	-35.9	-20.6
17/07/2010	22.40.24	-11.2	-26.3
19/07/2010	20.00.00	17.2	-12.4
21/07/2010	17.19.38	41.7	13.3
23/07/2010	14.39.17	49.4	42.6
25/07/2010	11.58.58	32.4	66.0
27/07/2010	9.18.40	5.3	55.9
29/07/2010	6.38.24	-22.6	27.1
31/07/2010	3.58.08	-43.2	-1.1
02/08/2010	1.17.55	-42.8	-24.1
03/08/2010	22.37.42	-22.0	-30.0
05/08/2010	19.57.31	6.0	-15.3
07/08/2010	17.17.21	32.7	11.0
09/08/2010	14.37.12	48.9	40.0
11/08/2010	11.57.04	40.4	61.9
13/08/2010	9.16.56	15.7	52.4
15/08/2010	6.36.50	-12.7	24.2
17/08/2010	3.56.45	-37.4	-5.1
19/08/2010	1.16.41	-46.8	-28.5
20/08/2010	22.36.37	-32.1	-35.1
22/08/2010	19.56.34	-5.8	-19.8
24/08/2010	17.16.32	22.3	7.0
26/08/2010	14.36.30	44.2	35.7
28/08/2010	11.56.29	45.9	56.3
30/08/2010	9.16.29	25.7	48.3
01/09/2010	6.36.29	-1.4	21.2
03/09/2010	3.56.29	-29.4	-8.6
05/09/2010	1.16.30	-46.9	-33.3
06/09/2010	22.36.31	-40.8	-41.2
08/09/2010	19.56.33	-17.2	-25.4
10/09/2010	17.16.34	11.0	2.1
12/09/2010	14.36.36	36.4	30.2
14/09/2010	11.56.38	47.7	49.8
16/09/2010	9.16.40	34.5	43.5
18/09/2010	6.36.42	8.5	18.0
20/09/2010	3.56.44	-19.9	-12.0
22/09/2010	1.16.46	-42.9	-38.2
23/09/2010	22.36.48	-47.1	-47.9
25/09/2010	19.56.50	-28.1	-31.5
27/09/2010	17.16.51	0.0	-3.5
29/09/2010	14.36.52	26.7	24.3
01/10/2010	11.56.53	45.3	43.1
03/10/2010	9.16.54	41.3	38.3
05/10/2010	6.36.54	18.6	14.4

Date	Time	h	h S
07/10/2010	3.56.53	-9.7	-15.4
09/10/2010	1.16.52	-36.0	-43.0
10/10/2010	22.36.51	-49.5	-54.6
12/10/2010	19.56.49	-37.9	-37.3
14/10/2010	17.16.46	-12.2	-9.1
16/10/2010	14.36.42	16.0	18.6
18/10/2010	11.56.38	39.3	36.6
20/10/2010	9.16.33	45.0	32.8
22/10/2010	6.36.27	27.8	10.4
24/10/2010	3.56.20	1.1	-18.9
26/10/2010	1.16.12	-27.2	-47.5
27/10/2010	22.36.03	-37.9	-60.7
29/10/2010	19.55.53	-45.7	-42.0
31/10/2010	17.15.42	-23.2	-13.2
02/11/2010	14.35.29	5.1	14.0
04/11/2010	11.55.16	31.0	31.0
06/11/2010	9.15.01	45.1	27.6
08/11/2010	6.34.45	35.6	6.3
10/11/2010	3.54.28	11.0	-22.7
12/11/2010	1.14.09	-17.5	-51.8
13/11/2010	22.33.48	-42.4	-65.7
15/11/2010	19.53.26	-50.5	-44.8
17/11/2010	17.13.03	-33.4	-15.6
19/11/2010	14.32.38	-6.2	11.0
21/11/2010	11.52.11	21.5	26.8
23/11/2010	9.11.43	41.6	23.0
25/11/2010	6.31.12	41.1	2.3
27/11/2010	3.50.40	20.4	-26.5
29/11/2010	1.10.07	-7.5	-55.9
30/11/2010	22.29.31	-34.7	-68.7
02/12/2010	19.48.53	-51.3	-45.3
04/12/2010	17.08.14	-42.2	-15.8
06/12/2010	14.27.32	-17.0	10.1
08/12/2010	11.46.49	11.4	24.5
10/12/2010	9.06.03	35.5	19.6
12/12/2010	6.25.15	43.7	-0.9
14/12/2010	3.44.25	28.9	-30.2
16/12/2010	1.03.32	2.8	-59.5
17/12/2010	22.22.38	-25.8	-69.1
19/12/2010	19.41.41	-48.1	-43.4
21/12/2010	17.00.42	-48.8	-13.8
23/12/2010	14.19.40	-17.0	11.5
25/12/2010	11.38.37	-2.5	24.4
27/12/2010	8.57.30	27.7	17.6
29/12/2010	6.16.22	43.2	-4.5
31/12/2010	3.35.11	35.8	-33.4

Tethys Congiunzione inferiore - Tethys Inferior conjunction

Date	Time	h	h S
01/01/2010	16.31.49	-47.6	-7.6
03/01/2010	13.50.16	-33.0	16.2
05/01/2010	11.08.41	-6.5	25.4
07/01/2010	8.27.03	21.8	14.5
09/01/2010	5.45.23	43.9	-10.0
11/01/2010	3.03.40	45.7	-39.4
13/01/2010	0.21.55	25.3	-65.8
14/01/2010	21.40.07	-2.1	-60.3
16/01/2010	18.58.17	-29.9	-31.5
18/01/2010	16.16.24	-46.9	-1.3
20/01/2010	13.34.29	-39.9	20.9
22/01/2010	10.52.32	-15.7	28.0
24/01/2010	8.10.32	12.9	14.3
26/01/2010	5.28.30	38.2	-11.8
28/01/2010	2.46.26	48.3	-41.3
30/01/2010	0.04.19	33.4	-64.4

Date	Time	h	h S
31/01/2010	21.22.11	6.8	-53.9
02/02/2010	18.40.00	-21.5	-24.8
04/02/2010	15.57.48	-43.3	4.9
06/02/2010	13.15.33	-44.6	27.2
08/02/2010	10.33.17	-24.1	31.8
10/02/2010	7.50.58	4.1	15.1
12/02/2010	5.08.38	31.2	-12.4
14/02/2010	2.26.17	48.1	-41.6
15/02/2010	23.43.53	40.5	-60.2
17/02/2010	21.01.28	16.0	-46.4
19/02/2010	18.19.02	-12.6	-17.3
21/02/2010	15.36.35	-37.5	12.4
23/02/2010	12.54.06	-46.7	34.4
25/02/2010	10.11.36	-31.6	36.3
27/02/2010	7.29.05	-4.8	16.5
01/03/2010	4.46.34	23.5	-12.2

Date	Time	h	h S
03/03/2010	2.04.01	45.4	-40.2
04/03/2010	23.21.28	46.1	-54.2
06/03/2010	20.38.55	24.9	-38.4
08/03/2010	17.56.20	-2.9	-9.5
10/03/2010	15.13.46	-30.2	20.4
12/03/2010	12.31.11	-46.0	42.1
14/03/2010	9.48.36	-37.9	40.8
16/03/2010	7.06.01	-13.4	18.0
18/03/2010	4.23.27	15.2	-11.3
20/03/2010	1.40.52	40.4	-37.6
21/03/2010	22.58.18	49.5	-47.3
23/03/2010	20.15.45	33.3	-30.3
25/03/2010	17.33.12	6.2	-0.8
27/03/2010	14.50.40	-21.9	28.4
29/03/2010	12.08.08	-42.6	49.8
31/03/2010	9.25.38	-42.5	44.9

Date	Time	h	h S
02/05/2010	11.26.59	-29.8	63.2
04/05/2010	8.45.01	-44.8	49.7
06/05/2010	6.03.05	-36.2	21.0
08/05/2010	3.21.12	-11.8	-7.2
10/05/2010	0.39.21	16.7	-26.9
11/05/2010	21.57.33	41.8	-27.8
13/05/2010	19.15.48	50.6	-9.3
15/05/2010	16.34.05	33.9	18.8
17/05/2010	13.52.25	6.7	48.7
19/05/2010	11.10.47	-21.2	67.8
21/05/2010	8.29.12	-41.7	50.0
23/05/2010	5.47.39	-41.6	20.7
25/05/2010	3.06.09	-21.0	-6.7
27/05/2010	0.24.42	6.9	-24.4
28/05/2010	21.43.17	34.0	-23.4
30/05/2010	19.01.55	50.6	-4.2
01/06/2010	16.20.36	41.8	23.5
03/06/2010	13.39.19	16.7	53.3
05/06/2010	10.58.05	-11.7	70.4
07/06/2010	8.16.53	-36.0	49.1
09/06/2010	5.35.43	-44.7	19.5
11/06/2010	2.54.37	-29.9	-7.1
13/06/2010	0.13.32	-3.2	-23.3
14/06/2010	21.32.30	24.6	-20.8
16/06/2010	18.51.31	46.8	-0.5
18/06/2010	16.10.34	47.8	26.8
20/06/2010	13.29.39	26.5	56.2
22/06/2010	10.48.47	-0.8	70.7
24/06/2010	8.07.56	-28.3	47.3
26/06/2010	5.27.08	-44.6	17.6
28/06/2010	2.46.22	-37.7	-8.6
30/06/2010	0.05.39	-14.2	-23.8
01/07/2010	21.24.57	14.2	-20.1

Date	Time	h	h S
03/07/2010	18.44.18	39.7	0.7
05/07/2010	16.03.40	50.4	28.3
07/07/2010	13.23.05	35.6	57.3
09/07/2010	10.42.31	9.0	69.0
11/07/2010	8.01.59	-19.2	44.8
13/07/2010	5.21.29	-41.0	15.1
15/07/2010	2.41.01	-43.6	-11.1
17/07/2010	0.00.35	-24.5	-26.0
18/07/2010	21.20.10	3.2	-21.5
20/07/2010	18.39.47	30.5	0.2
22/07/2010	15.59.25	48.8	27.9
24/07/2010	13.19.05	43.1	56.3
26/07/2010	10.38.47	19.3	65.9
28/07/2010	7.58.30	-9.1	42.0
30/07/2010	5.18.14	-34.5	12.3
01/08/2010	2.37.59	-46.3	-14.4
02/08/2010	23.57.46	-34.0	-29.8
04/08/2010	21.17.34	-8.4	-24.7
06/08/2010	18.37.24	19.8	-2.4
08/08/2010	15.57.14	43.2	25.5
10/08/2010	13.17.05	47.8	53.1
12/08/2010	10.36.58	29.1	61.6
14/08/2010	7.56.51	1.8	39.0
16/08/2010	5.16.46	-26.0	9.3
18/08/2010	2.36.41	-45.1	-18.2
19/08/2010	23.56.37	-41.9	-34.7
21/08/2010	21.16.34	-19.6	-29.6
23/08/2010	18.36.31	8.5	-7.2
25/08/2010	15.56.29	34.7	21.5
27/08/2010	13.16.28	48.5	48.2
29/08/2010	10.36.27	37.5	56.3
31/08/2010	7.56.27	12.1	35.7
02/09/2010	5.16.27	-16.3	6.3

Date	Time	h	h S
04/09/2010	2.36.28	-40.2	-22.1
05/09/2010	23.56.29	-47.1	-40.3
07/09/2010	21.16.30	-30.2	-35.6
09/09/2010	18.36.32	-2.7	-12.5
11/09/2010	15.56.33	24.5	16.4
13/09/2010	13.16.35	44.9	42.2
15/09/2010	10.36.37	43.7	50.4
17/09/2010	7.56.39	22.2	31.9
19/09/2010	5.16.41	-5.9	3.2
21/09/2010	2.36.43	-32.7	-26.1
22/09/2010	23.56.45	-48.4	-46.4
24/09/2010	21.16.47	-39.5	-42.2
26/09/2010	18.36.49	-14.8	-18.2
28/09/2010	15.56.50	13.5	10.8
30/09/2010	13.16.51	37.9	35.7
02/10/2010	10.36.51	46.5	44.1
04/10/2010	7.56.52	31.2	27.7
06/10/2010	5.16.52	4.8	0.2
08/10/2010	2.36.51	-23.5	-30.0
09/10/2010	23.56.50	-45.5	-52.3
11/10/2010	21.16.48	-46.6	-48.6
13/10/2010	18.36.45	-25.8	-23.6
15/10/2010	15.56.42	2.3	5.5
17/10/2010	13.16.38	28.9	29.6
19/10/2010	10.36.33	45.3	37.8
21/10/2010	7.56.28	38.5	23.1
23/10/2010	5.16.21	14.8	-3.7
25/10/2010	2.36.14	-13.6	-33.8
26/10/2010	23.56.05	-39.2	-57.9
28/10/2010	21.15.56	-50.3	-54.1
30/10/2010	18.35.45	-35.9	-27.8
01/11/2010	15.55.34	-9.4	1.4
03/11/2010	13.15.21	18.7	24.5

Date	Time	h	h S
05/11/2010	10.35.07	40.5	32.1
07/11/2010	7.54.51	43.2	18.4
09/11/2010	5.14.34	24.2	-7.9
11/11/2010	2.34.16	-2.8	-37.7
12/11/2010	23.53.57	-30.9	-62.9
14/11/2010	21.13.35	-49.8	-57.8
16/11/2010	18.33.13	-44.3	-30.2
18/11/2010	15.52.49	-20.3	-0.8
20/11/2010	13.12.23	8.1	20.9
22/11/2010	10.31.55	33.2	27.6
24/11/2010	7.51.26	44.6	14.0
26/11/2010	5.10.55	32.4	-11.8
28/11/2010	2.30.22	6.9	-41.5
29/11/2010	23.49.47	-21.6	-67.1
01/12/2010	21.09.11	-45.4	-59.1
03/12/2010	18.28.32	-50.0	-30.5
05/12/2010	15.47.51	-30.5	-1.2
07/12/2010	13.07.09	-2.1	19.4
09/12/2010	10.26.24	24.5	24.6
11/12/2010	7.45.37	42.5	10.4
13/12/2010	5.04.48	38.6	-15.5
15/12/2010	2.23.57	16.4	-45.2
16/12/2010	23.43.04	-11.8	-70.0
18/12/2010	21.02.08	-38.4	-57.8
20/12/2010	18.21.10	-52.1	-28.4
22/12/2010	15.40.10	-39.5	0.3
24/12/2010	12.59.07	-13.1	20.1
26/12/2010	10.18.02	-15.1	23.5
28/12/2010	7.36.54	37.7	7.9
30/12/2010	4.55.44	42.5	-18.6

Tethys Massima elongazione est - Tethys Maxima est elongation

Date	Time	h	h S
01/01/2010	3.52.45	46.4	-30.2
03/01/2010	1.11.00	27.0	-59.4
04/01/2010	22.29.11	-0.2	-68.2
06/01/2010	19.47.17	-28.4	-42.2
08/01/2010	17.05.18	-46.5	-12.3
10/01/2010	14.23.15	-41.0	13.4
12/01/2010	11.41.07	-17.4	26.2
14/01/2010	8.58.54	11.2	18.7
16/01/2010	6.16.36	37.0	-4.2
18/01/2010	3.34.13	48.3	-33.5
20/01/2010	0.51.46	34.5	-61.2
21/01/2010	22.09.14	8.0	-62.8
23/01/2010	19.26.37	-20.5	-35.4
25/01/2010	16.43.55	-42.9	-5.3
27/01/2010	14.01.07	-45.2	19.7
29/01/2010	11.18.15	-25.0	30.1
31/01/2010	8.35.18	3.3	18.9
02/02/2010	5.52.16	30.6	-6.5
04/02/2010	3.09.09	47.9	-36.1
06/02/2010	0.25.57	40.5	-60.7
07/02/2010	21.42.39	15.8	-55.1
09/02/2010	18.59.16	-12.9	-26.9
11/02/2010	16.15.48	-38.0	3.5
13/02/2010	13.32.15	-46.9	27.6
15/02/2010	10.48.36	-31.1	34.7
17/02/2010	8.04.52	-3.8	19.0
19/02/2010	5.21.02	24.5	-8.5
21/02/2010	2.37.07	45.9	-37.9
22/02/2010	23.53.06	44.9	-57.4
24/02/2010	21.09.00	22.6	-45.7
26/02/2010	18.24.49	-6.0	-16.9
28/02/2010	15.40.32	-32.7	13.5
02/03/2010	12.56.09	-46.7	36.6
04/03/2010	10.11.41	-35.7	38.9
06/03/2010	7.27.06	-9.8	18.4
08/03/2010	4.42.27	19.2	-10.9
10/03/2010	1.57.41	43.2	-38.8
11/03/2010	23.12.50	47.8	-51.4
13/03/2010	20.27.52	28.1	-34.9
15/03/2010	17.42.49	0.3	-5.4
17/03/2010	14.57.41	-27.9	24.8
19/03/2010	12.12.27	-45.4	45.9
21/03/2010	9.27.07	-38.6	41.2
23/03/2010	6.41.41	-14.2	16.0
25/03/2010	3.56.10	15.0	-13.9

Date	Time	h	h S
27/03/2010	1.10.34	40.7	-38.7
28/03/2010	22.24.53	49.5	-43.3
30/03/2010	19.39.07	32.3	-22.8
01/04/2010	16.53.15	4.5	7.4
03/04/2010	14.07.20	-24.1	37.2
05/04/2010	11.21.20	-43.7	54.1
07/04/2010	8.35.16	-40.3	40.3
09/04/2010	5.49.08	-17.2	11.7
11/04/2010	3.02.58	12.0	-17.5
13/04/2010	0.16.45	38.7	-37.0
14/04/2010	21.30.30	50.5	-33.4
16/04/2010	18.44.14	35.3	-9.7
18/04/2010	15.57.57	7.7	20.9
20/04/2010	13.11.42	-21.1	49.8
22/04/2010	10.25.27	-42.2	58.7
24/04/2010	7.39.15	-41.4	36.0
26/04/2010	4.53.07	-19.4	6.1
28/04/2010	2.07.02	9.5	-20.7
29/04/2010	23.21.04	36.8	-33.3
01/05/2010	20.35.12	50.9	-22.7
03/05/2010	17.49.28	37.9	3.4
05/05/2010	15.03.53	10.9	33.9
07/05/2010	12.18.29	-18.0	60.8
09/05/2010	9.33.17	-40.4	58.1
11/05/2010	6.48.19	-42.6	30.3
13/05/2010	4.03.35	-22.6	1.2
15/05/2010	1.19.07	5.7	-22.1
16/05/2010	22.34.56	33.4	-28.3
18/05/2010	19.51.04	50.6	-13.4
20/05/2010	17.07.30	41.8	13.5
22/05/2010	14.24.17	16.3	43.8
24/05/2010	11.41.24	-12.4	67.7
26/05/2010	8.58.53	-36.6	55.7
28/05/2010	6.16.43	-44.5	26.5
30/05/2010	3.34.55	-28.9	-0.9
01/06/2010	0.53.30	-1.5	-21.7
02/06/2010	22.12.26	25.9	-24.4
04/06/2010	19.31.44	47.5	-8.2
06/06/2010	16.51.25	47.5	18.5
08/06/2010	14.11.26	25.9	48.0
10/06/2010	11.31.48	-1.2	70.6
12/06/2010	8.52.31	-28.4	55.5
14/06/2010	6.13.32	-44.4	26.4
16/06/2010	3.34.52	-37.9	-0.3
18/06/2010	0.56.29	-14.9	-20.4

Date	Time	h	h S
19/06/2010	22.18.22	12.9	-23.4
21/06/2010	19.40.30	38.4	-8.2
23/06/2010	17.02.52	50.8	17.5
25/06/2010	14.25.26	38.4	46.5
27/06/2010	11.48.11	13.0	70.1
29/06/2010	9.11.06	-14.7	58.1
01/07/2010	6.34.10	-37.7	29.5
03/07/2010	3.57.22	-44.9	2.0
05/07/2010	1.20.40	-29.8	-19.2
06/07/2010	22.44.04	-4.0	-25.0
08/07/2010	20.07.32	23.3	-12.2
10/07/2010	17.31.05	45.3	12.3
12/07/2010	14.54.39	48.4	40.8
14/07/2010	12.18.16	29.3	66.0
16/07/2010	9.41.54	2.6	61.1
18/07/2010	7.05.32	-24.5	33.6
20/07/2010	4.29.10	-43.5	5.2
22/07/2010	1.52.47	-42.0	-18.3
23/07/2010	23.16.22	-21.5	-28.1
25/07/2010	20.39.56	5.7	-18.4
27/07/2010	18.03.27	32.0	4.9
29/07/2010	15.26.56	48.9	33.0
31/07/2010	12.50.22	42.5	59.2
02/08/2010	10.13.45	19.2	62.1
04/08/2010	7.37.05	-8.6	37.1
06/08/2010	5.00.22	-33.7	8.0
08/08/2010	2.23.34	-46.6	-17.8
09/08/2010	23.46.44	-36.2	-32.0
11/08/2010	21.09.49	-11.8	-25.8
13/08/2010	18.32.51	16.0	-3.6
15/08/2010	15.55.48	40.1	24.2
17/08/2010	13.18.42	48.7	51.0
19/08/2010	10.41.32	33.5	59.8
21/08/2010	8.04.17	7.4	39.0
23/08/2010	5.26.59	-20.3	10.0
25/08/2010	2.49.37	-42.3	-17.8
27/08/2010	0.12.11	-45.6	-36.2
28/08/2010	21.34.42	-27.1	-33.8
30/08/2010	18.57.09	0.3	-12.8
01/09/2010	16.19.32	26.9	15.2
03/09/2010	13.41.51	46.1	42.1
05/09/2010	11.04.07	43.5	54.7
07/09/2010	8.26.19	21.6	39.0
09/09/2010	5.48.28	-6.2	10.9
11/09/2010	3.10.33	-32.5	-18.2

Date	Time	h	h S
07/12/2010	1.14.08	-0.7	-56.5
08/12/2010	22.33.59	-29.4	-69.8
10/12/2010	19.53.47	-49.7	-46.1
12/12/2010	17.13.31	-46.6	-16.6

Date	Time	h	h S
14/12/2010	14.33.13	-23.4	9.3
16/12/2010	11.52.51	5.0	23.9
18/12/2010	9.12.27	30.6	19.4
20/12/2010	6.31.59	43.8	-0.8

Date	Time	h	h S
22/12/2010	3.51.28	33.8	-29.8
24/12/2010	1.10.55	9.2	-59.0
25/12/2010	22.30.18	-19.2	-69.4
27/12/2010	19.49.37	-44.0	-44.1

Date	Time	h	h S
29/12/2010	17.08.54	-51.5	-14.4
31/12/2010	14.28.08	-33.6	11.2

Tethys Massima elongazione ovest - Tethys Maxima west elongation

Date	Time	h	h S
02/01/2010	2.31.53	38.6	-45.2
03/01/2010	23.50.06	13.5	-69.5
05/01/2010	21.08.15	-15.1	-56.8
07/01/2010	18.26.18	-39.5	-27.1
09/01/2010	15.44.17	-47.1	1.8
11/01/2010	13.02.11	-30.4	22.0
13/01/2010	10.20.01	-2.8	25.0
15/01/2010	7.37.45	24.9	8.6
17/01/2010	4.55.25	45.6	-18.6
19/01/2010	2.13.00	44.1	-48.2
20/01/2010	23.30.31	21.9	-67.9
22/01/2010	20.47.56	-6.5	-50.2
24/01/2010	18.05.16	-33.1	-20.2
26/01/2010	15.22.32	-47.5	8.4
28/01/2010	12.39.42	-36.9	27.5
30/01/2010	9.56.48	-11.4	27.0
01/02/2010	7.13.48	17.4	7.4
03/02/2010	4.30.43	41.5	-21.2
05/02/2010	1.47.34	47.5	-50.1
06/02/2010	23.04.19	29.2	-63.0
08/02/2010	20.20.58	1.8	-41.9
10/02/2010	17.37.33	-26.4	-11.6
12/02/2010	14.54.02	-45.6	16.8
14/02/2010	12.10.26	-41.5	34.1
16/02/2010	9.26.44	-18.2	29.2
18/02/2010	6.42.57	10.6	6.2
20/02/2010	3.59.05	36.9	-23.4
22/02/2010	1.15.07	49.0	-50.3
23/02/2010	22.31.04	35.3	-55.5
25/02/2010	19.46.55	8.6	-32.0
27/02/2010	17.02.41	-20.1	-0.7
01/03/2010	14.18.21	-42.4	26.6
03/03/2010	11.33.55	-44.2	41.2
05/03/2010	8.49.24	-23.6	30.5
07/03/2010	6.04.47	4.9	4.3
09/03/2010	3.20.05	32.5	-25.6
11/03/2010	0.35.16	49.1	-48.5
12/03/2010	21.50.22	40.0	-46.1
14/03/2010	19.05.22	14.4	-20.7
16/03/2010	16.20.16	-14.6	10.2
18/03/2010	13.35.04	-38.9	37.5
20/03/2010	10.49.47	-45.3	47.4
22/03/2010	8.04.25	-27.6	29.9
24/03/2010	5.18.56	0.8	1.4
26/03/2010	2.33.23	28.8	-27.7
27/03/2010	23.47.44	48.5	-44.6
29/03/2010	21.02.00	43.3	-35.1
31/03/2010	18.16.12	18.8	-8.2
02/04/2010	15.30.18	-10.3	22.8

Date	Time	h	h S
04/04/2010	12.44.20	-35.8	48.7
06/04/2010	9.58.18	-45.5	50.7
08/04/2010	7.12.12	-30.2	26.6
10/04/2010	4.26.03	-2.2	-3.0
12/04/2010	1.39.51	26.1	-29.3
13/04/2010	22.53.37	47.8	-38.6
15/04/2010	20.07.22	45.6	-23.1
17/04/2010	17.21.06	22.0	5.5
19/04/2010	14.34.49	-7.1	36.2
21/04/2010	11.48.34	-33.4	58.8
23/04/2010	9.02.21	-45.3	49.5
25/04/2010	6.16.10	-32.0	21.0
27/04/2010	3.30.04	-5.3	-8.4
29/04/2010	0.44.02	23.8	-29.6
30/04/2010	21.58.07	46.8	-30.8
02/05/2010	19.12.19	47.4	-10.9
04/05/2010	16.26.39	25.1	18.5
06/05/2010	13.41.10	-3.6	48.7
08/05/2010	10.55.52	-30.7	65.0
10/05/2010	8.10.46	-44.9	45.1
12/05/2010	5.25.55	-34.5	15.3
14/05/2010	2.41.19	-9.0	-12.1
15/05/2010	23.56.59	20.0	-28.0
17/05/2010	21.12.58	44.4	-23.0
19/05/2010	18.29.15	49.5	-0.2
21/05/2010	15.45.51	30.0	28.6
23/05/2010	13.02.48	2.1	57.9
25/05/2010	10.20.06	-25.6	66.6
27/05/2010	7.37.45	-43.6	41.4
29/05/2010	4.55.46	-39.0	11.9
31/05/2010	2.14.10	-16.2	-13.3
01/06/2010	23.32.55	12.1	-25.7
03/06/2010	20.52.03	38.3	-18.2
05/06/2010	18.11.32	51.1	4.6
07/06/2010	15.31.23	38.2	33.2
09/06/2010	12.51.35	12.2	61.7
11/06/2010	10.12.07	-15.8	67.4
13/06/2010	7.32.59	-38.5	41.1
15/06/2010	4.54.10	-44.1	12.2
17/06/2010	2.15.39	-27.5	-12.3
18/06/2010	23.37.24	-0.5	-24.4
20/06/2010	20.59.25	26.3	-17.6
22/06/2010	18.21.40	47.4	4.1
24/06/2010	15.44.07	47.4	31.9
26/06/2010	13.06.47	26.4	60.2
28/06/2010	10.29.37	-0.3	69.0
30/06/2010	7.52.37	-27.3	44.1
02/07/2010	5.15.45	-44.2	15.2
04/07/2010	2.39.00	-39.6	-10.1

Date	Time	h	h S
06/07/2010	0.02.21	-17.6	-24.5
07/07/2010	21.25.48	9.8	-20.6
09/07/2010	18.49.18	35.6	-0.2
11/07/2010	16.12.52	50.2	26.3
13/07/2010	13.36.28	40.6	54.7
15/07/2010	11.00.05	16.2	69.2
17/07/2010	8.23.43	-11.5	48.0
19/07/2010	5.47.21	-35.7	19.1
21/07/2010	3.10.58	-45.9	-7.7
23/07/2010	0.34.35	-33.2	-25.5
24/07/2010	21.58.09	-8.3	-25.6
26/07/2010	19.21.42	19.3	-8.0
28/07/2010	16.45.12	42.6	18.6
30/07/2010	14.08.40	48.9	47.0
01/08/2010	11.32.04	31.9	65.8
03/08/2010	8.55.26	5.5	51.0
05/08/2010	6.18.44	-21.9	22.5
07/08/2010	3.41.58	-42.7	-5.8
09/08/2010	1.05.09	-44.1	-27.0
10/08/2010	22.28.17	-24.8	-31.5
12/08/2010	19.51.20	2.4	-16.1
14/08/2010	17.14.20	29.0	10.0
16/08/2010	14.37.16	47.4	38.3
18/08/2010	12.00.07	43.4	59.5
20/08/2010	9.22.55	21.0	51.6
22/08/2010	6.45.39	-6.8	24.7
24/08/2010	4.08.19	-32.6	-4.4
26/08/2010	1.30.55	-47.2	-28.9
27/08/2010	22.53.27	-38.2	-38.0
29/08/2010	20.15.56	-14.1	-24.8
31/08/2010	17.38.20	13.8	1.3
02/09/2010	15.00.42	38.3	29.3
04/09/2010	12.22.59	48.1	51.7
06/09/2010	9.45.13	33.9	49.7
08/09/2010	7.07.24	8.0	25.5
10/09/2010	4.29.31	-19.9	-3.8
12/09/2010	1.51.35	-42.5	-30.8
13/09/2010	23.13.35	-46.7	-44.5
15/09/2010	20.35.32	-28.4	-33.6
17/09/2010	17.57.26	-0.7	-8.1
19/09/2010	15.19.16	25.8	20.5
21/09/2010	12.41.04	45.1	43.3
23/09/2010	10.02.48	42.8	45.7
25/09/2010	7.24.29	21.1	24.8
27/09/2010	4.46.08	-6.7	-4.1
29/09/2010	2.07.43	-33.2	-32.7
30/09/2010	23.29.15	-48.7	-50.6
02/10/2010	20.50.45	-40.1	-42.0
04/10/2010	18.12.12	-15.6	-16.3

Date	Time	h	h S
06/10/2010	15.33.36	12.4	12.3
08/10/2010	12.54.57	36.8	35.3
10/10/2010	10.16.15	46.3	40.4
12/10/2010	7.37.30	32.2	22.7
14/10/2010	4.58.43	6.3	-5.3
16/10/2010	2.19.53	-21.9	-34.7
17/10/2010	23.41.00	-44.6	-56.1
19/10/2010	21.02.05	-48.0	-49.5
21/10/2010	18.23.07	-28.5	-23.3
23/10/2010	15.44.06	-0.4	5.4
25/10/2010	13.05.02	26.0	28.3
27/10/2010	10.25.56	44.1	34.8
29/10/2010	7.46.47	40.2	19.6
31/10/2010	5.07.35	18.0	-7.3
02/11/2010	2.28.21	-10.1	-36.9
03/11/2010	23.49.04	-36.5	-60.9
05/11/2010	21.09.45	-50.7	-55.4
07/11/2010	18.30.22	-39.5	-28.4
09/11/2010	15.50.57	-13.9	0.7
11/11/2010	13.11.29	14.2	22.8
13/11/2010	10.31.59	37.5	29.8
15/11/2010	7.52.25	44.3	16.1
17/11/2010	5.12.49	28.2	-9.8
19/11/2010	2.33.10	1.9	-39.4
20/11/2010	23.53.28	-26.4	-64.9
22/11/2010	21.13.44	-48.0	-59.1
24/11/2010	18.33.57	-47.6	-31.1
26/11/2010	15.54.06	-25.8	-1.9
28/11/2010	13.14.13	2.5	19.5
30/11/2010	10.34.17	28.5	26.1
02/12/2010	7.54.18	43.9	12.9
04/12/2010	5.14.17	36.3	-12.6
06/12/2010	2.34.12	12.6	-42.1
07/12/2010	23.54.04	-15.7	-68.0
09/12/2010	21.13.53	-41.3	-60.1
11/12/2010	18.33.39	-51.8	-31.3
13/12/2010	15.53.23	-36.3	-2.3
15/12/2010	13.13.03	-9.4	18.6
17/12/2010	10.32.40	18.5	24.2
19/12/2010	7.52.13	39.7	10.4
21/12/2010	5.11.44	41.6	-15.2
23/12/2010	2.31.12	22.5	-44.7
24/12/2010	23.50.37	-5.0	-69.7
26/12/2010	21.09.58	-32.6	-58.4
28/12/2010	18.29.16	-51.2	-29.1
30/12/2010	15.48.31	-44.8	-0.1

Dione Congiunzione superiore - Dione Superior conjunction

Date	Time	h	h S
01/01/2010	9.41.54	12.6	21.5
04/01/2010	3.23.16	45.1	-35.8
06/01/2010	21.04.30	-15.1	-56.0
09/01/2010	14.45.37	-43.0	10.2
12/01/2010	8.26.36	18.4	14.8
15/01/2010	2.07.27	41.8	-49.5
17/01/2010	19.48.11	-20.9	-40.5
20/01/2010	13.28.47	-39.2	21.5
23/01/2010	7.09.15	24.4	5.2
26/01/2010	0.49.36	37.6	-60.6
28/01/2010	18.29.50	-26.7	-23.9
31/01/2010	12.09.58	-34.4	29.8
03/02/2010	5.49.58	30.3	-6.7
05/02/2010	23.29.52	32.6	-63.7
08/02/2010	17.09.40	-32.2	-7.0
11/02/2010	10.49.22	-28.8	33.4
14/02/2010	4.28.59	36.0	-19.3
16/02/2010	22.08.30	27.0	-55.7

Date	Time	h	h S
19/02/2010	15.47.56	-37.1	10.0
22/02/2010	9.27.18	-22.5	31.2
25/02/2010	3.06.36	41.2	-31.6
27/02/2010	20.45.50	20.8	-41.4
02/03/2010	14.25.01	-41.3	25.9
05/03/2010	8.04.10	-15.8	24.0
08/03/2010	1.43.16	45.5	-41.6
10/03/2010	19.22.21	14.3	-24.7
13/03/2010	13.01.25	-44.2	39.8
16/03/2010	6.40.28	-8.8	13.5
19/03/2010	0.19.30	48.6	-46.6
21/03/2010	17.58.34	7.7	-7.1
24/03/2010	11.37.38	-45.7	49.3
27/03/2010	5.16.43	-0.8	1.9
29/03/2010	22.55.51	50.1	-44.1
01/04/2010	16.35.01	1.3	10.8
04/04/2010	10.14.14	-45.7	51.3
07/04/2010	3.53.30	5.7	-10.2



Date	Time	h	h S
17/07/2010	10.22.26	10.6	66.1
20/07/2010	4.05.54	-44.9	1.5
22/07/2010	21.49.27	-5.2	-24.6
25/07/2010	15.33.05	49.4	32.4
28/07/2010	9.16.47	5.6	55.4
31/07/2010	3.00.34	-46.1	-11.0
02/08/2010	20.44.25	-0.2	-20.7
05/08/2010	14.28.20	49.5	42.4
08/08/2010	8.12.19	1.0	42.8
11/08/2010	1.56.22	-46.7	-22.0
13/08/2010	19.40.28	3.7	-14.8
16/08/2010	13.24.37	48.8	50.4
19/08/2010	7.08.49	-4.2	29.5
22/08/2010	0.53.03	-46.6	-31.6
24/08/2010	18.37.20	7.7	-7.6
27/08/2010	12.21.40	47.4	54.7

Date	Time	h	h S
30/08/2010	6.06.01	-9.1	16.0
01/09/2010	23.50.25	-45.8	-39.2
04/09/2010	17.34.50	11.7	0.7
07/09/2010	11.19.16	45.3	54.0
10/09/2010	5.03.44	-13.8	2.6
12/09/2010	22.48.13	-44.5	-43.9
15/09/2010	16.32.42	15.6	8.4
18/09/2010	10.17.12	42.7	48.4
21/09/2010	4.01.42	-18.4	-11.3
23/09/2010	21.46.13	-42.6	-44.8
26/09/2010	15.30.43	19.5	16.1
29/09/2010	9.15.13	39.7	39.4
02/10/2010	2.59.42	-23.0	-24.7
04/10/2010	20.44.11	-40.2	-41.8
07/10/2010	14.28.39	23.2	22.9
10/10/2010	8.13.05	36.3	28.4

Date	Time	h	h S
13/10/2010	1.57.30	-27.4	-37.8
15/10/2010	19.41.53	-37.4	-35.7
18/10/2010	13.26.15	26.8	28.1
21/10/2010	7.10.34	32.5	16.2
24/10/2010	0.54.51	-31.8	-50.2
26/10/2010	18.39.06	-34.1	-27.5
29/10/2010	12.23.17	30.2	31.0
01/11/2010	6.07.26	28.4	3.4
03/11/2010	23.51.31	-36.1	-60.7
06/11/2010	17.35.34	-30.4	-18.1
09/11/2010	11.19.32	33.4	30.9
12/11/2010	5.03.26	24.0	-10.5
14/11/2010	22.47.17	-40.1	-66.3
17/11/2010	16.31.02	-26.4	-8.1
20/11/2010	10.14.44	36.4	27.5
23/11/2010	3.58.20	19.4	-24.4

Date	Time	h	h S
25/11/2010	21.41.52	-43.9	-63.3
28/11/2010	15.25.18	-22.0	2.2
01/12/2010	9.08.39	39.1	21.2
04/12/2010	2.51.54	14.5	-38.6
06/12/2010	20.35.03	-47.3	-53.6
09/12/2010	14.18.07	-17.3	11.3
12/12/2010	8.01.03	41.2	12.3
15/12/2010	1.43.54	9.3	-52.5
17/12/2010	19.26.38	-50.0	-40.8
20/12/2010	13.09.15	-12.2	19.0
23/12/2010	6.51.45	42.8	1.7
26/12/2010	0.34.08	4.0	-64.8
28/12/2010	18.16.23	-51.8	-26.7
31/12/2010	11.58.32	-6.8	24.2

# Dione Congiunzione inferiore - Dione Inferior conjunction

Date	Time	h	h S
02/01/2010	18.27.35	-41.6	-28.1
05/01/2010	12.08.54	-17.5	24.4
08/01/2010	5.50.05	43.8	-9.2
10/01/2010	23.31.08	15.0	-69.7
13/01/2010	17.12.04	-44.7	-12.7
16/01/2010	10.52.52	-11.5	26.8
19/01/2010	4.33.32	46.6	-22.4
21/01/2010	22.14.05	8.9	-63.4
24/01/2010	15.54.30	-46.8	3.0
27/01/2010	9.34.49	-5.1	24.5
30/01/2010	3.15.00	48.2	-35.8
01/02/2010	20.55.05	2.7	-49.3
04/02/2010	14.35.03	-47.4	17.4
07/02/2010	8.14.55	2.0	17.8
10/02/2010	1.54.41	48.5	-47.8
12/02/2010	19.34.21	-3.9	-32.7
15/02/2010	13.13.55	-46.5	30.1
18/02/2010	6.53.25	8.7	7.9
21/02/2010	0.32.50	47.3	-55.4
23/02/2010	18.12.11	-10.7	-15.2
26/02/2010	11.51.28	-44.0	39.0
01/03/2010	5.30.42	15.6	-3.7
03/03/2010	23.09.53	44.6	-54.5
06/03/2010	16.49.01	-17.2	2.9
09/03/2010	10.28.08	-40.2	41.9
12/03/2010	4.07.13	22.5	-16.1
14/03/2010	21.46.18	40.6	-45.0
17/03/2010	15.25.22	-23.4	20.1
20/03/2010	9.04.26	-35.2	38.1
23/03/2010	2.43.31	29.2	-27.1
25/03/2010	20.22.37	35.7	-30.8
28/03/2010	14.01.45	-29.1	36.5
31/03/2010	7.40.55	-29.6	29.1
03/04/2010	1.20.08	35.3	-34.9

Date	Time	h	h S
05/04/2010	18.59.24	30.1	-14.7
08/04/2010	12.38.43	-34.2	50.6
11/04/2010	6.18.06	-23.5	17.6
13/04/2010	23.57.34	40.8	-37.7
16/04/2010	17.37.07	24.1	2.5
19/04/2010	11.16.45	-38.5	59.2
22/04/2010	4.56.29	-17.2	5.7
24/04/2010	22.36.19	45.3	-34.4
27/04/2010	16.16.14	18.0	19.2
30/04/2010	9.56.17	-41.8	58.6
03/05/2010	3.36.26	-10.9	-5.8
05/05/2010	21.16.42	48.6	-26.2
08/05/2010	14.57.05	11.9	35.7
11/05/2010	8.37.35	-43.9	49.9
14/05/2010	2.18.13	-4.6	-15.3
16/05/2010	19.58.58	50.6	-14.8
19/05/2010	13.39.51	5.9	51.2
22/05/2010	7.20.52	-44.8	37.8
25/05/2010	1.02.00	1.7	-21.9
27/05/2010	18.43.16	51.1	-1.1
30/05/2010	12.24.40	0.4	64.4
02/06/2010	6.06.12	-44.7	24.9
04/06/2010	23.47.51	7.2	-24.9
07/06/2010	17.29.38	50.3	11.8
10/06/2010	11.11.32	-5.8	71.0
13/06/2010	4.53.34	-43.7	12.1
15/06/2010	22.35.43	12.5	-24.1
18/06/2010	16.18.00	48.4	25.4
21/06/2010	10.00.24	-11.2	66.0
24/06/2010	3.42.54	-41.8	0.5
26/06/2010	21.25.31	17.6	-20.0
29/06/2010	15.08.15	45.7	38.6
02/07/2010	8.51.06	-16.3	54.4
05/07/2010	2.34.03	-39.5	-10.8

Date	Time	h	h S
07/07/2010	20.17.05	22.3	-13.3
10/07/2010	14.00.14	42.3	50.8
13/07/2010	7.43.29	-21.1	41.2
16/07/2010	1.26.49	-36.6	-20.0
18/07/2010	19.10.14	26.6	-5.0
21/07/2010	12.53.45	38.6	60.5
24/07/2010	6.37.21	-25.7	27.6
27/07/2010	0.21.01	-33.5	-27.1
29/07/2010	18.04.46	30.6	4.4
01/08/2010	11.48.35	34.5	65.1
04/08/2010	5.32.28	-30.0	14.1
06/08/2010	23.16.25	-30.1	-31.5
09/08/2010	17.00.25	34.2	13.6
12/08/2010	10.44.30	30.3	62.0
15/08/2010	4.28.37	-34.0	1.1
17/08/2010	22.12.48	-26.6	-32.9
20/08/2010	15.57.01	37.4	22.8
23/08/2010	9.41.17	25.9	53.3
26/08/2010	3.25.35	-37.7	-12.3
28/08/2010	21.09.55	-23.0	-31.3
31/08/2010	14.54.17	40.1	31.1
03/09/2010	8.38.42	21.4	41.8
06/09/2010	2.23.07	-41.1	-24.7
08/09/2010	20.07.34	-19.2	-27.1
11/09/2010	13.52.02	42.4	37.8
14/09/2010	7.36.31	16.9	29.3
17/09/2010	1.21.00	-44.0	-36.3
19/09/2010	19.05.30	-15.3	-20.9
22/09/2010	12.50.00	44.1	42.0
25/09/2010	6.34.30	12.3	16.1
28/09/2010	0.19.00	-46.6	-46.4
30/09/2010	18.03.29	-11.4	-13.5
03/10/2010	11.47.58	45.3	42.8
06/10/2010	5.32.26	7.6	2.8

Date	Time	h	h S
08/10/2010	23.16.53	-48.5	-53.9
11/10/2010	17.01.18	-7.3	-5.3
14/10/2010	10.45.42	45.9	39.7
17/10/2010	4.30.05	2.9	-11.3
19/10/2010	22.14.25	-49.8	-56.9
22/10/2010	15.58.43	-2.6	3.2
25/10/2010	9.42.58	45.8	33.3
28/10/2010	3.27.11	-1.5	-25.1
30/10/2010	21.11.21	-50.4	-54.0
02/11/2010	14.55.28	1.5	10.9
05/11/2010	8.39.32	45.0	24.4
08/11/2010	2.23.32	-7.2	-39.0
10/11/2010	20.07.28	-50.2	-46.5
13/11/2010	13.51.20	5.7	17.7
16/11/2010	7.35.08	43.6	13.6
19/11/2010	1.18.52	-12.3	-52.5
21/11/2010	19.02.30	-49.0	-36.2
24/11/2010	12.46.04	10.2	22.7
27/11/2010	6.29.33	41.5	1.7
30/11/2010	0.12.57	-17.4	-64.6
02/12/2010	17.56.15	-47.0	-24.5
05/12/2010	11.39.27	14.7	25.1
08/12/2010	5.22.34	38.7	-11.7
10/12/2010	23.05.34	-22.6	-71.0
13/12/2010	16.48.28	-44.1	-12.2
16/12/2010	10.31.15	19.4	24.2
19/12/2010	4.13.56	35.3	-25.4
21/12/2010	21.56.29	-27.8	-65.9
24/12/2010	15.38.56	-40.4	0.6
27/12/2010	9.21.16	24.0	19.8
30/12/2010	3.03.28	31.3	-39.3

# Dione Massima elongazione est - Dione Maxima est elongation

Date	Time	h	h S
02/01/2010	2.07.34	35.2	-49.6
04/01/2010	19.48.55	-29.4	-42.8
07/01/2010	13.30.08	-32.3	18.9
10/01/2010	7.11.13	32.4	4.4
13/01/2010	0.52.11	30.2	-61.9
15/01/2010	18.33.02	-34.4	-27.0
18/01/2010	12.13.45	-27.0	26.4
21/01/2010	5.54.20	37.3	-7.8
23/01/2010	23.34.48	24.7	-67.2
26/01/2010	17.15.10	-38.9	-10.7
29/01/2010	10.55.24	-21.1	29.7
01/02/2010	4.35.32	41.8	-20.6
03/02/2010	22.15.33	18.7	-60.2
06/02/2010	15.55.29	-42.7	5.7
09/02/2010	9.35.18	-14.7	27.9
12/02/2010	3.15.01	45.6	-33.4
14/02/2010	20.54.40	12.4	-46.1
17/02/2010	14.34.13	-45.4	21.0
20/02/2010	8.13.42	-7.9	21.2
23/02/2010	1.53.07	48.2	-44.5
25/02/2010	19.32.28	5.9	-29.4
28/02/2010	13.11.46	-46.7	34.4
03/03/2010	6.51.01	-0.2	11.3

Date	Time	h	h S
06/03/2010	0.30.14	49.3	-50.9
08/03/2010	18.09.25	-0.2	-11.9
11/03/2010	11.48.35	-46.3	44.0
14/03/2010	5.27.44	6.5	0.0
16/03/2010	23.06.53	48.8	-49.4
19/03/2010	16.46.02	-7.6	6.1
22/03/2010	10.25.12	-44.4	47.0
25/03/2010	4.04.24	13.5	-12.4
27/03/2010	21.43.37	46.7	-40.4
30/03/2010	15.22.53	-14.0	23.5
02/04/2010	9.02.12	-41.1	42.6
05/04/2010	2.41.34	20.3	-22.9
07/04/2010	20.20.59	43.2	-2

Date	Time	h	h S
10/09/2010	21.31.12	-34.2	-38.3
13/09/2010	15.15.37	30.0	23.1
16/09/2010	9.00.04	32.0	41.5
19/09/2010	2.44.31	-32.5	-24.4
21/09/2010	20.28.59	-30.9	-34.9
24/09/2010	14.13.27	33.3	29.8
27/09/2010	7.57.54	27.8	29.6
30/09/2010	1.42.22	-36.5	-36.9
02/10/2010	19.26.49	-27.4	-29.0
05/10/2010	13.11.15	36.2	34.6
08/10/2010	6.55.40	23.5	16.9

Date	Time	h	h S
11/10/2010	0.40.04	-40.2	-48.4
13/10/2010	18.24.27	-23.7	-21.3
16/10/2010	12.08.48	38.8	36.5
19/10/2010	5.53.07	19.0	3.7
21/10/2010	23.37.24	-43.6	-57.7
24/10/2010	17.21.39	-19.7	-12.7
27/10/2010	11.05.51	41.0	35.1
30/10/2010	4.50.01	14.3	-10.3
01/11/2010	22.34.07	-46.6	-62.2
04/11/2010	16.18.11	-15.6	-3.2
07/11/2010	10.02.11	42.7	30.4

Date	Time	h	h S
10/11/2010	3.46.07	9.5	-24.2
12/11/2010	21.29.59	-49.1	-59.7
15/11/2010	15.13.47	-11.2	5.5
18/11/2010	8.57.31	43.8	22.9
21/11/2010	2.41.10	4.5	-38.3
23/11/2010	20.24.44	-50.9	-51.2
26/11/2010	14.08.14	-6.5	13.5
29/11/2010	7.51.38	44.3	13.1
02/12/2010	1.34.57	-0.2	-52.2
04/12/2010	19.18.10	-51.8	-39.7
07/12/2010	13.01.17	-0.9	19.9

Date	Time	h	h S
10/12/2010	6.44.18	44.0	1.9
13/12/2010	0.27.13	-6.3	-64.7
15/12/2010	18.10.01	-51.6	-26.7
18/12/2010	11.52.43	3.7	23.9
21/12/2010	5.35.18	42.9	-11.1
23/12/2010	23.17.46	-11.8	-71.4
26/12/2010	17.00.07	-50.3	-13.2
29/12/2010	10.42.21	8.8	24.4

Dione Massima elongazione ovest - Dione Maxima west elongation

Date	Time	h	h S
03/01/2010	10.56.07	-2.1	25.1
06/01/2010	4.37.23	48.3	-22.1
08/01/2010	22.18.31	0.5	-66.5
11/01/2010	15.59.32	-47.7	0.0
14/01/2010	9.40.25	3.6	22.6
17/01/2010	3.21.10	47.9	-36.0
19/01/2010	21.01.48	-6.2	-53.2
22/01/2010	14.42.19	-46.5	13.3
25/01/2010	8.22.42	9.9	16.1
28/01/2010	2.02.58	46.3	-49.0
30/01/2010	19.43.08	-12.5	-37.1
02/02/2010	13.23.11	-44.0	25.3
05/02/2010	7.03.08	16.4	6.5
08/02/2010	0.42.58	43.4	-58.4
10/02/2010	18.22.43	-18.7	-19.9
13/02/2010	12.02.22	-40.1	34.1
16/02/2010	5.41.56	23.0	-5.4
18/02/2010	23.21.25	39.3	-59.4
21/02/2010	17.00.50	-24.8	-1.7
24/02/2010	10.40.11	-35.2	37.6
27/02/2010	4.19.29	29.4	-17.8
01/03/2010	21.58.43	34.3	-50.5
04/03/2010	15.37.56	-30.5	14.9
07/03/2010	9.17.06	-29.4	34.8
10/03/2010	2.56.14	35.5	-29.4
12/03/2010	20.35.22	28.7	-36.3
15/03/2010	14.14.29	-35.6	31.1
18/03/2010	7.53.36	-23.1	26.8
21/03/2010	1.32.43	41.0	-38.3
23/03/2010	19.11.52	22.6	-19.8
26/03/2010	12.51.02	-39.8	45.1
29/03/2010	6.30.15	-16.5	15.9
01/04/2010	0.09.30	45.5	-42.0
03/04/2010	17.48.48	16.2	-1.9

Date	Time	h	h S
06/04/2010	11.28.10	-42.9	54.4
09/04/2010	5.07.36	-9.8	4.1
11/04/2010	22.47.06	48.8	-39.1
14/04/2010	16.26.41	9.8	14.9
17/04/2010	10.06.21	-44.7	55.4
20/04/2010	3.46.07	-2.4	-7.6
22/04/2010	21.25.59	50.6	-30.6
25/04/2010	15.05.56	3.6	31.8
28/04/2010	8.46.00	-45.2	48.4
01/05/2010	2.26.10	3.8	-17.2
03/05/2010	20.06.26	50.8	-18.6
06/05/2010	13.46.49	-2.2	47.8
09/05/2010	7.27.19	-44.4	37.1
12/05/2010	1.07.55	10.0	-23.9
14/05/2010	18.48.38	49.5	-4.7
17/05/2010	12.29.28	-8.8	61.6
20/05/2010	6.10.25	-42.5	24.5
22/05/2010	23.51.28	15.9	-26.7
25/05/2010	17.32.39	46.9	9.8
28/05/2010	11.13.55	-14.5	69.5
31/05/2010	4.55.19	-39.7	12.0
02/06/2010	22.36.49	21.6	-25.3
05/06/2010	16.18.25	43.5	24.3
08/06/2010	10.00.09	-19.9	65.8
11/06/2010	3.41.59	-36.4	0.6
13/06/2010	21.23.56	26.8	-20.2
16/06/2010	15.06.00	39.5	38.6
19/06/2010	8.48.10	-24.9	54.7
22/06/2010	2.30.27	-32.6	-10.4
24/06/2010	20.12.51	31.6	-12.4
27/06/2010	13.55.21	35.0	51.9
30/06/2010	7.37.58	-29.5	41.4
03/07/2010	1.20.41	-28.7	-19.0
05/07/2010	19.03.31	35.8	-2.3

Date	Time	h	h S
08/07/2010	12.46.27	30.4	63.0
11/07/2010	6.29.29	-33.8	27.7
14/07/2010	0.12.37	-24.6	-25.1
16/07/2010	17.55.50	39.5	7.6
19/07/2010	11.39.10	25.6	68.4
22/07/2010	5.22.34	-37.5	14.2
24/07/2010	23.06.04	-20.4	-28.2
27/07/2010	16.49.39	42.5	18.0
30/07/2010	10.33.18	20.8	64.6
02/08/2010	4.17.03	-40.8	1.4
04/08/2010	22.00.51	-16.2	-28.3
07/08/2010	15.44.43	44.9	28.1
10/08/2010	9.28.40	16.0	54.7
13/08/2010	3.12.40	-43.6	-11.7
15/08/2010	20.56.44	-12.1	-25.6
18/08/2010	14.40.51	46.6	37.2
21/08/2010	8.25.00	11.2	42.5
24/08/2010	2.09.13	-45.8	-23.5
26/08/2010	19.53.28	-8.0	-20.6
29/08/2010	13.37.45	47.6	44.4
01/09/2010	7.22.05	6.4	29.5
04/09/2010	1.06.26	-47.4	-34.2
06/09/2010	18.50.49	-3.6	-14.0
09/09/2010	12.35.14	47.8	48.6
12/09/2010	6.19.39	1.8	16.1
15/09/2010	0.04.06	-48.3	-43.1
17/09/2010	17.48.33	0.7	-6.4
20/09/2010	11.33.01	47.4	48.6
23/09/2010	5.17.29	-2.8	2.6
25/09/2010	23.01.57	-48.6	-49.1
28/09/2010	16.46.25	4.5	1.9
01/10/2010	10.30.52	46.3	44.2
04/10/2010	4.15.19	-8.1	-11.4
06/10/2010	21.59.45	-48.1	-51.0

Date	Time	h	h S
09/10/2010	15.44.10	8.5	9.5
12/10/2010	9.28.34	44.5	36.5
15/10/2010	3.12.56	-12.9	-25.1
17/10/2010	20.57.16	-47.0	-48.1
20/10/2010	14.41.35	12.6	16.6
23/10/2010	8.25.51	42.2	26.4
26/10/2010	2.10.05	-17.7	-38.6
28/10/2010	19.54.16	-45.2	-41.5
31/10/2010	13.38.24	16.6	22.5
03/11/2010	7.22.29	39.3	14.9
06/11/2010	1.06.31	-22.5	-51.7
08/11/2010	18.50.29	-42.7	-32.3
11/11/2010	12.34.24	20.6	26.4
14/11/2010	6.18.14	36.0	2.4
17/11/2010	0.02.00	-27.3	-63.1
19/11/2010	17.45.42	-39.6	-21.8
22/11/2010	11.29.18	24.6	27.5
25/11/2010	5.12.50	34.2	-11.3
27/11/2010	22.56.17	-32.0	-69.2
30/11/2010	16.39.39	-35.9	-10.7
03/12/2010	10.22.55	28.6	25.3
06/12/2010	4.06.05	27.9	-25.1
08/12/2010	21.49.09	-36.7	-65.2
11/12/2010	15.32.07	-31.6	0.9
14/12/2010	9.14.58	32.3	19.9
17/12/2010	2.57.43	23.3	-39.2
19/12/2010	20.40.21	-41.1	-54.0
22/12/2010	14.22.53	-26.9	11.0
25/12/2010	8.05.17	35.9	11.8
28/12/2010	1.47.34	18.2	-53.0
30/12/2010	19.29.44	-45.1	-40.0

Rhea Congiunzione superiore - Rhea Superior conjunction

Date	Time	h	h S
03/01/2010	5.43.26	46.0	-10.4
07/01/2010	18.09.16	-41.5	-24.0
12/01/2010	6.34.32	36.6	-0.8
16/01/2010	18.59.12	-29.8	-31.6
21/01/2010	7.23.17	23.3	7.1
25/01/2010	19.46.48	-15.5	-38.7
30/01/2010	8.09.46	8.7	15.3
03/02/2010	20.32.13	0.2	-45.0
08/02/2010	8.54.09	-6.4	23.2
12/02/2010	21.15.37	14.7	-49.9
17/02/2010	9.36.39	-20.6	30.5
21/02/2010	21.57.19	28.6	-52.9
26/02/2010	10.17.38	-33.1	37.1
02/03/2010	22.37.41	40.4	-53.5
07/03/2010	10.57.30	-42.4	42.4
11/03/2010	23.17.09	48.1	-51.5
16/03/2010	11.36.41	-46.3	46.2
20/03/2010	23.56.12	49.3	-47.1
25/03/2010	12.15.44	-43.5	47.9
30/03/2010	0.35.21	43.6	-41.0
03/04/2010	12.55.08	-35.0	47.2

Date	Time	h	h S
08/04/2010	1.15.07	33.0	-33.7
12/04/2010	13.35.21	-22.9	44.4
17/04/2010	1.55.55	19.7	-25.5
21/04/2010	14.16.51	-8.9	39.7
26/04/2010	2.38.12	5.3	-16.8
30/04/2010	14.59.59	6.3	33.8
05/05/2010	3.22.16	-9.8	-7.7
09/05/2010	15.45.02	21.4	27.0
14/05/2010	4.08.21	-24.1	2.1
18/05/2010	16.32.13	35.5	19.6
23/05/2010	4.56.38	-36.3	11.5
27/05/2010	17.21.38	46.6	12.0
01/06/2010	5.47.12	-43.9	21.3
05/06/2010	18.13.20	51.1	4.3
10/06/2010	6.40.02	-43.8	31.3
14/06/2010	19.07.17	46.0	-3.4
19/06/2010	7.35.05	-35.6	41.4
23/06/2010	20.03.25	33.7	-11.2
28/06/2010	8.32.16	-22.0	51.4
02/07/2010	21.01.37	17.7	-18.0
07/07/2010	9.31.26	-5.7	60.7

Date	Time	h	h S
11/07/2010	22.01.43	0.7	-23.7
16/07/2010	10.32.26	11.8	67.2
20/07/2010	23.03.34	-17.3	-27.4
25/07/2010	11.35.06	28.5	67.3
30/07/2010	0.06.58	-33.1	-28.4
03/08/2010	12.39.12	42.4	60.0
08/08/2010	1.11.44	-44.3	-26.2
12/08/2010	13.44.34	49.1	48.3
17/08/2010	2.17.39	-46.3	-20.6
21/08/2010	14.50.59	44.7	34.6
26/08/2010	3.24.32	-37.8	-12.4
30/08/2010	15.58.15	31.6	19.8
04/09/2010	4.32.08	-22.9	-1.6
08/09/2010	17.06.10	14.3	4.5
13/09/2010	5.40.18	-5.2	8.6
17/09/2010	18.14.31	-4.5	-11.2
22/09/2010	6.48.47	13.1	19.3
26/09/2010	19.23.05	-23.0	-26.3
01/10/2010	7.57.22	29.8	28.5
05/10/2010	20.31.39	-39.1	-40.4
10/10/2010	9.05.52	42.3	34.9

# Rhea Congiunzione inferiore - Rhea Inferior conjunction

Date	Time	h	h S
05/01/2010	11.55.37	-15.1	24.8
10/01/2010	0.21.10	23.1	-66.2
14/01/2010	12.46.07	-29.7	23.8
19/01/2010	1.10.30	36.6	-58.7
23/01/2010	13.34.18	-41.2	21.7
28/01/2010	1.57.32	45.9	-49.9
01/02/2010	14.20.15	-47.1	18.6
06/02/2010	2.42.27	48.5	-40.5
10/02/2010	15.04.09	-45.5	14.8
15/02/2010	3.25.25	43.5	-30.8
19/02/2010	15.46.16	-37.3	10.3
24/02/2010	4.06.46	33.4	-21.0
28/02/2010	16.26.57	-25.4	5.4
05/03/2010	4.46.53	20.6	-11.0
09/03/2010	17.06.38	-11.7	0.5
14/03/2010	5.26.14	6.7	-0.2
18/03/2010	17.45.46	3.0	-5.3
23/03/2010	6.05.18	-7.6	9.4
27/03/2010	18.24.53	17.3	-10.6
01/04/2010	6.44.36	-21.1	19.4

Date	Time	h	h S
05/04/2010	19.04.29	30.9	-15.6
10/04/2010	7.24.36	-33.1	29.4
14/04/2010	19.45.01	42.6	-20.0
19/04/2010	8.05.47	-42.0	39.3
23/04/2010	20.26.55	49.8	-23.7
28/04/2010	8.48.30	-45.2	48.8
02/05/2010	21.10.32	49.8	-26.3
07/05/2010	9.33.04	-41.2	57.6
11/05/2010	21.56.07	42.0	-27.7
16/05/2010	10.19.43	-31.2	64.9
20/05/2010	22.43.52	29.3	-27.7
25/05/2010	11.08.34	-17.5	69.0
29/05/2010	23.33.51	14.1	-26.1
03/06/2010	11.59.42	-1.1	67.8
08/06/2010	0.26.07	-1.5	-22.9
12/06/2010	12.53.05	14.6	61.8
17/06/2010	1.20.37	-18.5	-18.3
21/06/2010	13.48.40	30.4	53.0
26/06/2010	2.17.15	-33.0	-12.3
30/06/2010	14.46.21	43.6	42.7

Date	Time	h	h S
05/07/2010	3.15.55	-43.2	-4.8
09/07/2010	15.45.58	50.3	31.4
14/07/2010	4.16.27	-45.2	3.9
18/07/2010	16.47.22	46.5	19.5
23/07/2010	5.18.40	-37.6	13.4
27/07/2010	17.50.21	34.1	7.1
01/08/2010	6.22.23	-23.6	23.7
05/08/2010	18.54.45	17.4	-5.6
10/08/2010	7.27.25	-6.6	34.4
14/08/2010	20.00.21	-0.3	-18.0
19/08/2010	8.33.33	11.5	44.3
23/08/2010	21.06.57	-19.2	-29.3
28/08/2010	9.40.34	28.6	51.8
01/09/2010	22.14.21	-35.5	-38.3
06/09/2010	10.48.17	42.1	54.1
10/09/2010	23.22.20	-46.5	-43.2
15/09/2010	11.56.29	47.7	49.4
20/09/2010	0.30.42	-47.2	-42.7
24/09/2010	13.04.58	42.0	39.5
29/09/2010	1.39.14	-37.4	-37.1

Date	Time	h	h S
03/10/2010	14.13.30	28.1	26.6
08/10/2010	2.47.43	-21.6	-28.1
12/10/2010	15.21.53	10.6	12.4
17/10/2010	3.55.56	-3.4	-17.6
21/10/2010	16.29.53	-8.3	-1.6
26/10/2010	5.03.40	14.4	-6.9
30/10/2010	17.37.17	-26.4	-17.0
04/11/2010	6.10.41	30.4	3.3
08/11/2010	18.43.52	-41.8	-31.1
13/11/2010	7.16.46	41.8	11.6
17/11/2010	19.49.22	-50.7	-44.3
22/11/2010	8.21.40	44.4	18.2
26/11/2010	20.53.36	-48.6	-56.3
01/12/2010	9.25.10	37.3	22.5
05/12/2010	21.56.19	-37.2	-66.0
10/12/2010	10.27.03	23.8	24.5
14/12/2010	22.57.18	-21.5	-71.1
19/12/2010	11.27.05	7.6	24.5
23/12/2010	23.56.21	-4.5	-69.2
28/12/2010	12.25.06	-9.6	22.7

# Rhea Massima elongazione est - Rhea Maxima est elongation

Date	Time	h	h S
04/01/2010	8.49.52	19.8	17.0
08/01/2010	21.15.34	-11.7	-57.5
13/01/2010	9.40.40	4.3	22.5
17/01/2010	22.05.10	4.4	-63.2
22/01/2010	10.29.06	-11.5	27.1
26/01/2010	22.52.28	19.5	-65.6
31/01/2010	11.15.17	-25.8	30.6
04/02/2010	23.37.34	33.2	-63.9
09/02/2010	11.59.22	-37.8	32.9
14/02/2010	0.20.41	43.7	-58.8
18/02/2010	12.41.35	-45.4	33.7
23/02/2010	1.02.06	48.9	-51.6
27/02/2010	13.22.18	-46.5	33.0
04/03/2010	1.42.14	46.9	-43.2
08/03/2010	14.01.56	-40.9	30.9
13/03/2010	2.21.29	38.7	-34.1
17/03/2010	14.40.55	-30.5	27.5
22/03/2010	3.00.20	27.0	-24.6
26/03/2010	15.19.47	-17.6	23.2
31/03/2010	3.39.20	13.6	-14.9
04/04/2010	15.59.02	-3.0	18.0

Date	Time	h	h S
09/04/2010	4.18.56	-0.1	-5.0
13/04/2010	16.39.07	11.3	12.4
18/04/2010	4.59.37	-14.9	5.2
22/04/2010	17.20.29	25.7	6.5
27/04/2010	5.41.47	-28.1	15.2
01/05/2010	18.03.33	38.7	0.8
06/05/2010	6.25.48	-38.8	25.2
10/05/2010	18.48.36	48.3	-5.5
15/05/2010	7.11.56	-44.6	35.3
19/05/2010	19.35.52	50.9	-11.1
24/05/2010	8.00.24	-42.9	45.3
28/05/2010	20.25.32	44.8	-16.1
02/06/2010	8.51.16	-34.1	55.0
06/06/2010	21.17.37	32.5	-20.2
11/06/2010	9.44.32	-20.6	63.8
15/06/2010	22.12.03	16.9	-23.2
20/06/2010	10.40.08	-4.4	70.2
24/06/2010	23.08.45	0.3	-24.6
29/06/2010	11.37.52	12.5	70.7
04/07/2010	0.07.29	-17.2	-24.1
08/07/2010	12.37.35	28.9	64.2

Date	Time	h	h S
13/07/2010	1.08.07	-32.5	-21.3
17/07/2010	13.39.05	42.7	53.9
22/07/2010	2.10.27	-43.5	-16.2
26/07/2010	14.42.11	49.7	41.6
31/07/2010	3.14.16	-45.8	-8.9
04/08/2010	15.46.40	45.8	28.3
09/08/2010	4.19.23	-37.9	0.7
13/08/2010	16.52.22	33.1	14.2
18/08/2010	5.25.35	-23.4	10.6
22/08/2010	17.59.03	16.0	0.3
27/08/2010	6.32.41	-6.0	21.4
31/08/2010	19.06.31	-2.0	-14.7
05/09/2010	7.40.29	12.2	31.9
09/09/2010	20.14.35	-21.1	-28.4
14/09/2010	8.48.47	29.2	40.5
18/09/2010	21.23.02	-37.3	-40.5
23/09/2010	9.57.21	42.3	45.3
27/09/2010	22.31.40	-47.8	-49.3
02/10/2010	11.05.59	46.8	44.4
06/10/2010	23.40.16	-47.5	-52.3
11/10/2010	12.14.29	40.3	38.0

Date	Time	h	h S
16/10/2010	0.48.37	-36.8	-48.8
20/10/2010	13.22.37	26.1	27.9
25/10/2010	1.56.29	-20.7	-40.8
29/10/2010	14.30.11	8.7	15.8
03/11/2010	3.03.40	-2.2	-30.7
07/11/2010	15.36.56	-10.0	3.2
12/11/2010	4.09.56	14.9	-20.2
16/11/2010	16.42.39	-27.8	-10.0
21/11/2010	5.15.02	30.5	-10.2
25/11/2010	17.47.05	-42.8	-22.5
30/11/2010	6.18.46	41.4	-0.3
04/12/2010	18.50.03	-51.3	-34.4
09/12/2010	7.20.54	43.9	7.3
13/12/2010	19.51.17	-49.1	-45.6
18/12/2010	8.21.12	37.1	14.1
22/12/2010	20.50.36	-38.0	-55.5
27/12/2010	9.19.30	34.3	19.7
31/12/2010	21.47.50	-22.9	-63.7

# Rhea Massima elongazione ovest - Rhea Maxima west elongation

Date	Time	h	h S
02/01/2010	2.33.29	38.8	-44.9
06/01/2010	14.59.29	-43.2	7.8
11/01/2010	3.24.53	47.1	-35.5
15/01/2010	15.49.42	-47.7	2.0
20/01/2010	4.13.55	47.5	-26.0
24/01/2010	16.37.33	-43.9	-4.3
29/01/2010	5.00.39	40.2	-16.4
02/02/2010	17.23.12	-33.9	-10.7
07/02/2010	5.45.14	28.5	-6.8
11/02/2010	18.06.47	-20.8	-16.8
16/02/2010	6.27.53	14.8	3.1
20/02/2010	18.48.36	-6.4	-22.6
25/02/2010	7.08.57	0.8	12.5
01/03/2010	19.29.00	8.4	-27.9
06/03/2010	7.48.48	-13.7	21.9
10/03/2010	20.08.25	22.6	-32.5
15/03/2010	8.27.55	-26.8	31.1
19/03/2010	20.47.20	35.4	-36.1
24/03/2010	9.06.45	-37.6	39.9
28/03/2010	21.26.14	45.5	-38.3
02/04/2010	9.45.51	-44.4	47.9

Date	Time	h	h S
06/04/2010	22.05.39	50.3	-38.9
11/04/2010	10.25.41	-45.1	54.8
15/04/2010	22.46.01	47.7	-37.7
20/04/2010	11.06.42	-39.1	59.6
24/04/2010	23.27.47	38.8	-34.8
29/04/2010	11.49.18	-28.3	61.2
04/05/2010	0.11.18	26.0	-30.4
08/05/2010	12.33.49	-14.6	59.2
13/05/2010	0.56.53	11.3	-24.7
17/05/2010	13.20.31	1.1	54.1
22/05/2010	1.44.45	-4.3	-18.0
26/05/2010	14.09.35	16.5	46.9
31/05/2010	2.35.01	-19.8	-10.5
04/06/2010	15.01.04	31.7	38.5
09/06/2010	3.27.42	-33.5	-1.5
13/06/2010	15.54.56	44.3	29.3
18/06/2010	4.22.44	-43.0	6.9
22/06/2010	16.51.05	50.7	19.6
27/06/2010	5.19.57	-44.7	16.3
01/07/2010	17.49.20	47.0	9.5
06/07/2010	6.19.12	-37.4	26.3

Date	Time	h	h S
10/07/2010	18.49.31	35.0	-0.3
15/07/2010	7.20.17	-23.8	36.7
19/07/2010	19.51.27	18.7	-11.2
24/07/2010	8.23.00	-7.2	47.0
28/07/2010	20.54.55	1.1	-20.7
02/08/2010	9.27.10	10.7	56.1
06/08/2010	21.59.44	-17.4	-28.8
11/08/2010	10.32.35	27.8	61.6
15/08/2010	23.05.42	-33.6	-34.1
20/08/2010	11.39.03	41.8	60.0
25/08/2010	0.12.37	-45.1	-35.5
29/08/2010	12.46.22	48.4	51.4
03/09/2010	1.20.16	-46.9	-32.3
07/09/2010	13.54.19	43.7	38.8
12/09/2010	2.28.29	-38.1	-25.3
16/09/2010	15.02.43	30.3	24.4
21/09/2010	3.37.01	-22.8	-15.7
25/09/2010	16.11.20	12.9	9.1
30/09/2010	4.45.40	-4.9	-4.9
04/10/2010	17.19.59	-6.0	-6.7
09/10/2010	5.54.15	13.3	6.0

Date	Time	h	h S
13/10/2010	18.28.26	-24.4	-22.0
18/10/2010	7.02.31	29.9	15.7
22/10/2010	19.36.28	-40.3	-36.8
27/10/2010	8.10.16	41.9	23.3
31/10/2010	20.43.52	-49.8	-50.3
05/11/2010	9.17.16	45.2	28.0
09/11/2010	21.50.25	-48.3	-61.4
14/11/2010	10.23.17	38.1	29.3
18/11/2010	22.55.51	-37.0	-67.4
23/11/2010	11.28.05	24.2	27.3
27/11/2010	23.59.58	-21.0	-65.7
02/12/2010	12.31.27	7.5	22.8
07/12/2010	1.02.32	-3.3	-58.5
11/12/2010	13.33.10	-10.4	16.6
16/12/2010	2.03.20	13.4	-49.1
20/12/2010	14.33.00	-27.3	9.6
25/12/2010	3.02.10	28.4	-39.2
29/12/2010	15.30.47	-41.9	2.2

# Titano Congiunzione superiore - Titano Superior conjunction

Date	Time	h	h S
02/01/2010	4.33.50	48.2	-22.7
18/01/2010	3.21.23	48.1	-35.9
03/02/2010	1.41.45	46.6	-51.4
18/02/2010	23.37.54	41.4	-59.3
06/03/2010	21.15.49	31.0	-43.8
22/03/2010	18.44.09	16.8	-15.2

Date	Time	h	h S
07/04/2010	16.13.00	1.9	16.1
23/04/2010	13.52.00	-11.9	44.3
09/05/2010	11.49.07	-21.6	63.9
25/05/2010	10.09.31	-27.3	65.5
10/06/2010	8.55.29	-29.1	56.0
26/06/2010	8.06.59	-27.3	47.0

Date	Time	h	h S
12/07/2010	7.42.05	-21.9	41.0
28/07/2010	7.37.54	-12.8	38.3
13/08/2010	7.50.47	0.3	38.1
29/08/2010	8.16.49	14.6	39.5
14/09/2010	8.51.56	29.7	40.9
30/09/2010	9.31.50	41.9	40.7

Date	Time	h	h S
16/10/2010	10.12.10	46.2	38.0
01/11/2010	10.48.18	40.8	33.5
17/11/2010	11.15.29	29.7	28.9
03/12/2010	11.28.48	17.9	25.6
19/12/2010	11.23.24	8.3	24.5

# Titano Congiunzione inferiore - Titano Inferior conjunction

Date	Time	h	h S
10/01/2010	0.58.09	29.3	-61.2
25/01/2010	23.32.51	25.8	-66.7
10/02/2010	21.44.10	18.3	-54.5
26/02/2010	19.36.03	7.4	-29.9
14/03/2010	17.15.18	-6.2	0.1
30/03/2010	14.50.26	-19.7	29.1

Date	Time	h	h S
15/04/2010	12.30.32	-31.1	53.5
01/05/2010	10.23.40	-38.7	61.4
17/05/2010	8.35.39	-42.5	50.6
02/06/2010	7.09.51	-43.8	36.6
18/06/2010	6.07.08	-44.0	25.2
04/07/2010	5.26.34	-43.1	16.9

Date	Time	h	h S
20/07/2010	5.05.57	-40.2	11.5
05/08/2010	5.02.18	-33.9	8.5
21/08/2010	5.12.18	-24.0	7.7
06/09/2010	5.32.19	-11.0	8.5
22/09/2010	5.58.45	4.0	10.3
08/10/2010	6.27.40	18.7	12.1

Date	Time	h	h S
24/10/2010	6.55.04	31.7	13.0
09/11/2010	7.16.45	40.7	12.6
25/11/2010	7.28.16	44.3	10.7
11/12/2010	7.25.11	43.5	7.6
27/12/2010	7.03.13	41.1	3.1

# Titano Massima elongazione est - Titano Maxima est elongation

Date	Time	h	h S
06/01/2010	5.54.07	44.2	-8.6
22/01/2010	4.34.36	45.7	-22.0
07/02/2010	2.50.14	48.2	-38.9
23/02/2010	0.44.21	48.4	-53.6
10/03/2010	22.23.12	42.9	-49.7
26/03/2010	19.55.05	32.1	-26.3

Date	Time	h	h S
11/04/2010	17.29.23	18.9	2.9
27/04/2010	15.14.56	6.8	30.5
13/05/2010	13.19.01	-2.0	53.6
29/05/2010	11.46.39	-7.9	68.2
14/06/2010	10.39.39	-8.8	70.1
30/06/2010	9.56.54	-5.7	65.0

Date	Time	h	h S
16/07/2010	9.35.28	1.4	60.2
01/08/2010	9.32.01	11.0	57.0
17/08/2010	9.43.01	22.8	55.0
02/09/2010	10.04.46	34.9	52.8
18/09/2010	10.33.35	44.2	49.2
04/10/2010	11.05.30	46.7	43.6

Date	Time	h	h S
20/10/2010	11.36.31	40.6	36.8
05/11/2010	12.02.22	29.4	30.3
21/11/2010	12.18.38	17.0	25.3
07/12/2010	12.20.54	6.0	23.0
23/12/2010	12.04.47	-1.5	23.4

# Titano Massima elongazione ovest - Titano Maxima west elongation

Date	Time	h	h S
13/01/2010	22.46.48	9.0	-68.2
29/01/2010	21.14.22	3.9	-53.1
14/02/2010	19.17.11	-5.8	-29.1
02/03/2010	17.00.16	-18.3	0.2
18/03/2010	14.31.27	-31.3	29.3
03/04/2010	12.00.12	-41.3	52.1

Date	Time	h	h S
19/04/2010	9.36.08	-45.3	52.9
05/05/2010	7.27.49	-43.7	36.5
21/05/2010	5.41.39	-40.4	19.4
06/06/2010	4.21.18	-38.7	6.5
22/06/2010	3.27.04	-39.6	-1.6
08/07/2010	2.56.42	-42.7	-8.1

Date	Time	h	h S
24/07/2010	2.47.01	-45.7	-11.7
09/08/2010	2.54.27	-45.6	-13.6
25/08/2010	3.15.27	-39.4	-13.7
10/09/2010	3.46.10	-27.3	-11.8
26/09/2010	4.22.41	-11.6	-8.4
12/10/2010	5.00.52	5.5	-4.4

Date	Time	h	h S
28/10/2010	5.36.18	21.2	-0.7
13/11/2010	6.04.24	33.7	0.5
29/11/2010	6.20.17	41.3	0.1
15/12/2010	6.19.08	43.8	-2.5
31/12/2010	5.56.26	43.5	-8.1

TEMPI IN T.U.            TIMES IN U.T.

H = altitudine di Saturno sull'orizzonte  
H S = altitudine del Sole sull'orizzonte

Date in the format dd/mm/yyyy  
H = altitude of Saturn on the horizon  
H S = altitude of the Sun on the horizon

# MERIDIANO CENTRALE DI SATURNO I

(Banda equatoriale nord NEB, zona equatoriale EZ, banda equatoriale sud SEB)

## CENTRAL MERIDIAN OF SATURN I

(North Equatorial Band, equatorial zone, Sud Equatorial Band)

Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian
01/01/2010	0.10.23	10.24.21	20.38.18	17/03/2010	1.03.29	11.17.26	21.31.22	31/05/2010	2.06.53	12.20.57	22.35.00	14/08/2010	3.26.37	13.40.44	23.54.50
02/01/2010	6.52.16	17.06.13		18/03/2010	7.45.19	17.59.16		01/06/2010	8.49.04	19.03.07		15/08/2010	10.08.56	20.23.02	
03/01/2010	3.20.11	13.34.08	23.48.05	19/03/2010	4.13.12	14.27.09		02/06/2010	5.17.10	15.31.14		16/08/2010	6.37.09	16.51.15	
04/01/2010	10.02.02	20.16.00		20/03/2010	0.41.06	10.55.03	21.09.00	03/06/2010	1.45.17	11.59.21	22.13.25	17/08/2010	3.05.21	13.19.28	23.33.34
05/01/2010	6.29.57	16.43.54		21/03/2010	7.22.57	17.36.54		04/06/2010	8.27.28	18.41.32		18/08/2010	9.47.40	20.01.46	
06/01/2010	2.57.51	13.11.48	23.25.45	22/03/2010	3.50.50	14.04.48		05/06/2010	4.55.36	15.09.39		19/08/2010	6.15.53	16.29.58	
07/01/2010	9.39.42	19.53.40		23/03/2010	0.18.44	10.32.42	20.46.39	06/06/2010	1.23.43	11.37.47	21.51.51	20/08/2010	2.44.05	12.58.11	23.12.17
08/01/2010	6.07.36	16.21.34		24/03/2010	7.00.36	17.14.33		07/06/2010	8.05.54	18.19.59		21/08/2010	9.26.23	19.40.30	
09/01/2010	2.35.30	12.49.28	23.03.24	25/03/2010	3.28.30	13.42.27	23.56.24	08/06/2010	4.34.02	14.48.06		22/08/2010	5.54.36	16.08.42	
10/01/2010	9.17.21	19.31.18		26/03/2010	10.10.22	20.24.19		09/06/2010	1.02.10	11.16.14	21.30.18	23/08/2010	2.22.48	12.36.54	22.51.01
11/01/2010	5.45.15	15.59.12		27/03/2010	6.38.16	16.52.13		10/06/2010	7.44.22	17.58.26		24/08/2010	9.05.07	19.19.13	
12/01/2010	2.13.09	12.27.06	22.41.03	28/03/2010	3.06.11	13.20.08	23.34.06	11/06/2010	4.12.31	14.26.35		25/08/2010	5.33.19	15.47.25	
13/01/2010	8.54.59	19.08.56		29/03/2010	9.48.03	20.02.01		12/06/2010	0.40.39	10.54.44	21.08.48	26/08/2010	2.01.31	12.15.37	22.29.43
14/01/2010	5.22.53	15.36.49		30/03/2010	6.15.58	16.29.56		13/06/2010	7.22.52	17.36.56		27/08/2010	8.43.50	18.57.55	
15/01/2010	1.50.46	12.04.42	22.18.39	31/03/2010	2.43.53	12.57.51	23.11.48	14/06/2010	3.51.01	14.05.05		28/08/2010	5.12.02	15.26.07	
16/01/2010	8.32.36	18.46.33		01/04/2010	9.25.46	19.39.44		15/06/2010	0.19.10	10.33.14	20.47.18	29/08/2010	1.40.14	11.54.20	22.08.26
17/01/2010	5.00.29	15.14.26		02/04/2010	5.53.42	16.07.39		16/06/2010	7.01.23	17.15.27		30/08/2010	8.22.32	18.36.38	
18/01/2010	1.28.22	11.42.19	21.56.15	03/04/2010	2.21.37	12.35.35	22.49.33	17/06/2010	3.29.32	13.43.37	23.57.41	31/08/2010	4.50.44	15.04.50	
19/01/2010	8.10.12	18.24.08		04/04/2010	9.03.31	19.17.29		18/06/2010	10.11.46	20.25.51		01/09/2010	1.18.56	11.33.02	21.47.08
20/01/2010	4.38.05	14.52.01		05/04/2010	5.31.27	15.45.25		19/06/2010	6.39.55	16.54.00		02/09/2010	8.01.14	18.15.20	
21/01/2010	1.05.57	11.19.54	21.33.50	06/04/2010	1.59.23	12.13.21	22.27.19	20/06/2010	3.08.05	13.22.10	23.36.14	03/09/2010	4.29.26	14.43.32	
22/01/2010	7.47.46	18.01.42		07/04/2010	8.41.17	18.55.16		21/06/2010	9.50.19	20.04.24		04/09/2010	0.57.37	11.11.44	21.25.49
23/01/2010	4.15.39	14.29.35		08/04/2010	5.09.14	15.23.12		22/06/2010	6.18.29	16.32.34		05/09/2010	7.39.55	17.54.01	
24/01/2010	0.43.32	10.57.28	21.11.24	09/04/2010	1.37.11	11.51.09	22.05.07	23/06/2010	2.46.39	13.00.43	23.14.49	06/09/2010	4.08.07	14.22.13	
25/01/2010	7.25.20	17.39.17		10/04/2010	8.19.06	18.33.04		24/06/2010	9.28.53	19.42.59		07/09/2010	0.36.19	10.50.25	21.04.30
26/01/2010	3.53.13	14.07.09		11/04/2010	4.47.03	15.01.01		25/06/2010	5.57.03	16.11.09		08/09/2010	7.18.36	17.32.42	
27/01/2010	0.21.05	10.35.01	20.48.57	12/04/2010	1.15.00	11.28.59	21.42.57	26/06/2010	2.25.14	12.39.19	22.53.24	09/09/2010	3.46.48	14.00.53	
28/01/2010	7.02.54	17.16.50		13/04/2010	7.56.56	18.10.55		27/06/2010	9.07.29	19.21.35		10/09/2010	0.14.59	10.29.05	20.43.11
29/01/2010	3.30.46	13.44.42	23.58.38	14/04/2010	4.24.54	14.38.52		28/06/2010	5.35.40	15.49.45		11/09/2010	6.57.16	17.11.22	
30/01/2010	10.12.34	20.26.30		15/04/2010	0.52.51	11.06.50	21.20.49	29/06/2010	2.03.50	12.17.56	22.32.01	12/09/2010	3.25.27	13.39.33	23.53.39
31/01/2010	6.40.26	16.54.22		16/04/2010	7.34.48	17.48.47		30/06/2010	8.46.06	19.00.11		13/09/2010	10.07.45	20.21.50	
01/02/2010	3.08.18	13.22.14	23.36.10	17/04/2010	4.02.46	14.16.45		01/07/2010	5.14.17	15.28.22		14/09/2010	6.35.56	16.50.02	
02/02/2010	9.50.06	20.04.02		18/04/2010	0.30.44	10.44.44	20.58.43	02/07/2010	1.42.28	11.56.33	22.10.39	15/09/2010	3.04.07	13.18.13	23.32.18
03/02/2010	6.17.58	16.31.54		19/04/2010	7.12.42	17.26.41		03/07/2010	8.24.44	18.38.49		16/09/2010	9.46.24	20.00.29	
04/02/2010	2.45.50	12.59.46	23.13.42	20/04/2010	3.40.41	13.54.40		04/07/2010	4.52.55	15.07.00		17/09/2010	6.14.35	16.28.40	
05/02/2010	9.27.38	19.41.34		21/04/2010	0.08.40	10.22.39	20.36.39	05/07/2010	1.21.06	11.35.12	21.49.17	18/09/2010	2.42.45	12.56.50	23.10.56
06/02/2010	5.55.30	16.09.25		22/04/2010	6.50.38	17.04.38		06/07/2010	8.03.23	18.17.29		19/09/2010	9.25.01	19.39.07	
07/02/2010	2.23.22	12.37.17	22.51.13	23/04/2010	3.18.38	13.32.37	23.46.37	07/07/2010	4.31.34	14.45.40		20/09/2010	5.53.12	16.07.17	
08/02/2010	9.05.09	19.19.05		24/04/2010	10.00.37	20.14.37		08/07/2010	0.59.45	11.13.51	21.27.57	21/09/2010	2.21.22	12.35.28	22.49.34
09/02/2010	5.33.01	15.46.56		25/04/2010	6.28.36	16.42.36		09/07/2010	7.42.03	17.56.08		22/09/2010	9.03.39	19.17.44	
10/02/2010	2.00.53	12.14.48	22.28.44	26/04/2010	2.56.36	13.10.36	23.24.36	10/07/2010	4.10.14	14.24.20		23/09/2010	5.31.49	15.45.54	
11/02/2010	8.42.40	18.56.36		27/04/2010	9.38.36	19.52.36		11/07/2010	0.38.26	10.52.32	21.06.37	24/09/2010	1.59.59	12.14.05	22.28.10
12/02/2010	5.10.32	15.24.28		28/04/2010	6.06.37	16.20.37		12/07/2010	7.20.43	17.34.49		25/09/2010	8.42.15	18.56.20	
13/02/2010	1.38.23	11.52.19	22.06.15	29/04/2010	2.34.37	12.48.37	23.02.38	13/07/2010	3.48.55	14.03.00		26/09/2010	5.10.25	15.24.30	
14/02/2010	8.20.11	18.34.07		30/04/2010	9.16.38	19.30.39		14/07/2010	0.17.07	10.31.12	20.45.18	27/09/2010	1.38.35	11.52.40	22.06.45
15/02/2010	4.48.02	15.01.58		01/05/2010	5.44.39	15.58.39		15/07/2010	6.59.24	17.13.30		28/09/2010	8.20.50	18.34.55	
16/02/2010	1.15.54	11.29.50	21.43.45	02/05/2010	2.12.40	12.26.41	22.40.41	16/07/2010	3.27.36	13.41.42	23.55.48	29/09/2010	4.49.00	15.03.05	
17/02/2010	7.57.42	18.11.37		03/05/2010	8.54.42	19.08.43		17/07/2010	10.09.54	20.24.00		30/09/2010	1.17.10	11.31.15	21.45.20
18/02/2010	4.25.33	14.39.29		04/05/2010	5.22.43	15.36.44		18/07/2010	6.38.06	16.52.12		01/10/2010	7.59.24	18.13.29	
19/02/2010	0.53.25	11.07.21	21.21.17	05/05/2010	1.50.45	12.04.46	22.18.47	19/07/2010	3.06.18	13.20.24	23.34.30	02/10/2010	4.27.34	14.41.39	
20/02/2010	7.35.12	17.49.08		06/05/2010	8.32.48	18.46.49		20/07/2010	9.48.36	20.02.42		03/10/2010	0.55.43	11.09.48	21.23.53
21/02/2010	4.03.04	14.17.00		07/05/2010	5.00.50	15.14.51		21/07/2010	6.16.48	16.30.54		04/10/2010	7.37.58	17.52.02	
22/02/2010	0.30.56	10.44.52	20.58.47	08/05/2010	1.28.52	11.42.53	21.56.54	22/07/2010	2.45.01	12.59.06	23.13.13	05/10/2010	4.06.07	14.20.11	
23/02/2010	7.12.43	17.26.39		09/05/2010	8.10.56	18.24.57		23/07/2010	9.27.19	19.41.25		06/10/2010	0.34.16	10.48.21	21.02.25
24/02/2010	3.40.35	13.54.31		10/05/2010	4.38.58	14.53.00		24/07/2010	5.55.31	16.09.37		07/10/2010	7.16.30	17.30.34	
25/02/2010	0.08.27	10.22.23	20.36.19	11/05/2010	1.07.01	11.21.03	21.35.04	25/07/2010	2.23.43	12.37.50	22.51.56	08/10/2010	3.44.39	13.58.43	
26/02/2010	6.50.15	17.04.10		12/05/2010	7.49.06	18.03.07		26/07/2010	9.06.02	19.20.08		09/10/2010	0.12.48	10.26.52	20.40.56
27/02/2010	3.18.07	13.32.02	23.45.59	13/05/2010	4.17.09	14.31.11		27/07/2010	5.34.14	15.48.21		10/10/2010	6.55.00	17.09.05	
28/02/2010	9.59.54	20.13.51		14/05/2010	0.45.12	10.59.14	21.13.16	28/07/2010	2.02.27	12.16.33	22.30.39	11/10/2010	3.23.09	13.37.14	23.51.18
01/03/2010	6.27.46	16.41.43		15/05/2010	7.27.18	17.41.19		29/07/2010	8.44.45	18.58.51		12/10/2010	10.05.22	20.19.26	
02/03/2010	2.55.38	13.09.35	23.23.30	16/05/2010	3.55.21	14.09.23		30/07/2010	5.12.58	15.27.04		13/10/2010	6.33.30	16.47.34	
03/03/2010	9.37.26	19.51.23		17/05/2010	0.23.25	10.37.27	20.51.30	31/07/2010	1.41.10	11.55.16	22.09.23	14/10/2010	3.01.39	13.15.43	23.29.47
04/03/2010	6.05.18	16.19.15		18/05/2010	7.05.3										

Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian
28/10/2010	4.45.39	14.59.43		14/11/2010	6.07.24	16.21.26		01/12/2010	7.28.18	17.42.19		18/12/2010	8.48.19	19.02.18	
29/10/2010	1.13.46	11.27.49	21.41.52	15/11/2010	2.35.28	12.49.30	23.03.32	02/12/2010	3.56.19	14.10.20		19/12/2010	5.16.17	15.30.17	
30/10/2010	7.55.55	18.09.59		16/11/2010	9.17.34	19.31.36		03/12/2010	0.24.20	10.38.21	20.52.21	20/12/2010	1.44.16	11.58.15	22.12.14
31/10/2010	4.24.01	14.38.05		17/11/2010	5.45.37	15.59.39		04/12/2010	7.06.22	17.20.22		21/12/2010	8.26.13	18.40.12	
01/11/2010	0.52.07	11.06.10	21.20.13	18/11/2010	2.13.41	12.27.42	22.41.44	05/12/2010	3.34.23	13.48.23		22/12/2010	4.54.11	15.08.10	
02/11/2010	7.34.16	17.48.19		19/11/2010	8.55.46	19.09.47		06/12/2010	0.02.23	10.16.24	20.30.24	23/12/2010	1.22.09	11.36.08	21.50.07
03/11/2010	4.02.22	14.16.24		20/11/2010	5.23.49	15.37.50		07/12/2010	6.44.24	16.58.24		24/12/2010	8.04.06	18.18.05	
04/11/2010	0.30.27	10.44.30	20.58.33	21/11/2010	1.51.52	12.05.53	22.19.55	08/12/2010	3.12.25	13.26.25	23.40.25	25/12/2010	4.32.04	14.46.03	
05/11/2010	7.12.36	17.26.38		22/11/2010	8.33.56	18.47.58		09/12/2010	9.54.25	20.08.25		26/12/2010	1.00.02	11.14.00	21.27.59
06/11/2010	3.40.41	13.54.43		23/11/2010	5.01.59	15.16.00		10/12/2010	6.22.25	16.36.25		27/12/2010	7.41.58	17.55.57	
07/11/2010	0.08.46	10.22.48	20.36.51	24/11/2010	1.30.01	11.44.03	21.58.04	11/12/2010	2.50.25	13.04.25	23.18.25	28/12/2010	4.09.55	14.23.54	
08/11/2010	6.50.53	17.04.56		25/11/2010	8.12.05	18.26.06		12/12/2010	9.32.24	19.46.24		29/12/2010	0.37.52	10.51.51	21.05.49
09/11/2010	3.18.58	13.33.00	23.47.03	26/11/2010	4.40.07	14.54.08		13/12/2010	6.00.24	16.14.24		30/12/2010	7.19.48	17.33.46	
10/11/2010	10.01.05	20.15.07		27/11/2010	1.08.09	11.22.10	21.36.11	14/12/2010	2.28.23	12.42.23	22.56.23	31/12/2010	3.47.45	14.01.43	
11/11/2010	6.29.09	16.43.12		28/11/2010	7.50.12	18.04.13		15/12/2010	9.10.22	19.24.22		01/01/2011	0.15.41		
12/11/2010	2.57.14	13.11.16	23.25.18	29/11/2010	4.18.14	14.32.15		16/12/2010	5.38.21	15.52.21					
13/11/2010	9.39.20	19.53.22		30/11/2010	0.46.16	11.00.16	21.14.17	17/12/2010	2.06.20	12.20.20	22.34.19				

Orari in T.U. in cui transita il Meridiano Centrale

Date in the format dd/mm/yyyy

TIMES IN U.T.

# MERIDIANO CENTRALE DI SATURNO III

(Origine delle radio emissioni)

## CENTRAL MERIDIAN OF SATURN III

(Radio emissions)

Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian
01/01/2010	5.08.22	15.47.42		16/03/2010	8.32.47	19.12.06		29/05/2010	1.27.37	12.07.03	22.46.29	11/08/2010	5.18.31	15.58.01	
02/01/2010	2.27.01	13.06.21	23.45.41	17/03/2010	5.51.25	16.30.44		30/05/2010	9.25.54	20.05.20		12/08/2010	2.37.30	13.16.59	23.56.27
03/01/2010	10.25.01	21.04.20		18/03/2010	3.10.03	13.49.22		31/05/2010	6.44.46	17.24.12		13/08/2010	10.35.57	21.15.26	
04/01/2010	7.43.40	18.22.59		19/03/2010	0.28.40	11.07.59	21.47.18	01/06/2010	4.03.38	14.43.04		14/08/2010	7.54.55	18.34.24	
05/01/2010	5.02.19	15.41.38		20/03/2010	8.26.37	19.05.56		02/06/2010	1.22.30	12.01.56	22.41.22	15/08/2010	5.13.54	15.53.23	
06/01/2010	2.20.58	13.00.18	23.39.37	21/03/2010	5.45.15	16.24.34		03/06/2010	9.20.48	20.00.14		16/08/2010	2.32.52	13.12.21	23.51.50
07/01/2010	10.18.56	20.58.16		22/03/2010	3.03.54	13.43.13		04/06/2010	6.39.40	17.19.07		17/08/2010	10.31.19	21.10.48	
08/01/2010	7.37.35	18.16.54		23/03/2010	0.22.32	11.01.51	21.41.10	05/06/2010	3.58.33	14.37.59		18/08/2010	7.50.17	18.29.46	
09/01/2010	4.56.13	15.35.33		24/03/2010	8.20.30	18.59.49		06/06/2010	1.17.26	11.56.52	22.36.18	19/08/2010	5.09.15	15.48.45	
10/01/2010	2.14.52	12.54.11	23.33.31	25/03/2010	5.39.08	16.18.27		07/06/2010	9.15.45	19.55.11		20/08/2010	2.28.14	13.07.42	23.47.11
11/01/2010	10.12.50	20.52.09		26/03/2010	2.57.47	13.37.06		08/06/2010	6.34.38	17.14.04		21/08/2010	10.26.40	21.06.10	
12/01/2010	7.31.28	18.10.47		27/03/2010	0.16.26	10.55.45	21.35.05	09/06/2010	3.53.31	14.32.58		22/08/2010	7.45.39	18.25.08	
13/01/2010	4.50.06	15.29.25		28/03/2010	8.14.24	18.53.44		10/06/2010	1.12.25	11.51.51	22.31.18	23/08/2010	5.04.37	15.44.06	
14/01/2010	2.08.44	12.48.03	23.27.22	29/03/2010	5.33.04	16.12.23		11/06/2010	9.10.44	19.50.11		24/08/2010	2.28.14	13.03.03	23.42.33
15/01/2010	10.06.41	20.46.00		30/03/2010	2.51.43	13.31.02		12/06/2010	6.29.38	17.09.05		25/08/2010	10.22.02	21.01.31	
16/01/2010	7.25.19	18.04.37		31/03/2010	0.10.22	10.49.42	21.29.02	13/06/2010	3.48.32	14.27.59		26/08/2010	7.41.00	18.20.29	
17/01/2010	4.43.57	15.23.15		01/04/2010	8.08.22	18.47.42		14/06/2010	1.07.26	11.46.53	22.26.20	27/08/2010	4.59.58	15.39.27	
18/01/2010	2.02.34	12.35.41	23.21.12	02/04/2010	5.27.02	16.06.22		15/06/2010	9.05.47	19.45.14		28/08/2010	2.18.55	12.58.24	23.37.53
19/01/2010	10.00.30	20.39.49		03/04/2010	2.45.42	13.25.02		16/06/2010	6.24.41	17.04.09		29/08/2010	10.17.22	20.56.51	
20/01/2010	7.19.07	17.58.26		04/04/2010	0.04.22	10.43.42	21.23.02	17/06/2010	3.43.36	14.23.03		30/08/2010	7.36.20	18.15.49	
21/01/2010	4.37.45	15.17.04		05/04/2010	8.02.22	18.41.43		18/06/2010	1.02.30	11.41.57	22.21.25	31/08/2010	4.55.18	15.34.46	
22/01/2010	1.56.22	12.35.41	23.14.59	06/04/2010	5.21.03	16.00.23		19/06/2010	9.00.52	19.40.20		01/09/2010	2.14.15	12.53.44	23.33.13
23/01/2010	9.54.18	20.33.36		07/04/2010	2.39.44	13.19.04	23.58.25	20/06/2010	6.19.47	16.59.15		02/09/2010	10.12.42	20.52.11	
24/01/2010	7.12.55	17.52.13		08/04/2010	10.37.45	21.17.06		21/06/2010	3.38.42	14.18.09		03/09/2010	7.31.40	18.11.09	
25/01/2010	4.31.32	15.10.50		09/04/2010	7.56.26	18.35.47		22/06/2010	0.57.37	11.37.05	22.16.32	04/09/2010	4.50.37	15.30.06	
26/01/2010	1.50.09	12.29.27	23.08.45	10/04/2010	5.15.07	15.54.28		23/06/2010	8.56.00	19.35.28		05/09/2010	2.09.34	12.49.03	23.28.32
27/01/2010	9.48.04	20.27.22		11/04/2010	2.33.49	13.13.10	23.52.30	24/06/2010	6.14.55	16.54.23		06/09/2010	10.08.01	20.47.30	
28/01/2010	7.06.41	17.45.59		12/04/2010	10.31.51	21.11.12		25/06/2010	3.33.50	14.13.18		07/09/2010	7.26.58	18.06.27	
29/01/2010	4.25.17	15.04.36		13/04/2010	7.50.33	18.29.54		26/06/2010	0.52.46	11.32.14	22.11.42	08/09/2010	4.45.55	15.25.24	
30/01/2010	1.43.54	12.23.12	23.02.30	14/04/2010	5.09.15	15.48.36		27/06/2010	8.51.10	19.30.38		09/09/2010	2.04.52	12.44.21	23.23.50
31/01/2010	9.41.48	20.21.07		15/04/2010	2.27.57	13.07.19	23.46.40	28/06/2010	6.10.06	16.49.34		10/09/2010	10.03.19	20.42.47	
01/02/2010	7.00.25	17.39.43		16/04/2010	10.26.01	21.05.22		29/06/2010	3.29.01	14.08.29		11/09/2010	7.22.16	18.01.44	
02/02/2010	4.19.01	14.58.20		17/04/2010	7.44.44	18.24.05		30/06/2010	0.47.58	11.27.26	22.06.54	12/09/2010	4.41.12	15.20.41	
03/02/2010	1.37.38	12.16.56	22.56.14	18/04/2010	5.03.27	15.42.48		01/07/2010	8.46.22	19.25.50		13/09/2010	2.00.09	12.39.38	23.19.06
04/02/2010	9.35.32	20.14.50		19/04/2010	2.22.10	13.01.31	23.40.53	02/07/2010	6.05.18	16.44.46		14/09/2010	9.58.35	20.38.03	
05/02/2010	6.54.09	17.33.27		20/04/2010	10.20.15	20.59.36		03/07/2010	3.24.14	14.03.42		15/09/2010	7.17.32	17.57.00	
06/02/2010	4.12.45	14.52.03		21/04/2010	7.38.58	18.18.20		04/07/2010	0.43.11	11.22.39	22.02.07	16/09/2010	4.36.28	15.15.57	
07/02/2010	1.31.21	12.10.39	22.49.57	22/04/2010	4.57.42	15.37.04		05/07/2010	8.41.36	19.21.04		17/09/2010	1.55.25	12.34.53	23.14.22
08/02/2010	9.29.15	20.08.33		23/04/2010	2.16.26	12.55.48	23.35.10	06/07/2010	6.00.33	16.40.00		18/09/2010	9.53.50	20.33.18	
09/02/2010	6.47.51	17.27.09		24/04/2010	10.14.32	20.53.54		07/07/2010	3.19.29	13.58.57		19/09/2010	7.12.47	17.52.14	
10/02/2010	4.06.27	14.45.45		25/04/2010	7.33.16	18.12.38		08/07/2010	0.38.26	11.17.54	21.57.23	20/09/2010	4.31.43	15.11.11	
11/02/2010	1.25.03	12.04.21	22.43.39	26/04/2010	4.52.00	15.31.23		09/07/2010	8.36.51	19.16.20		21/09/2010	1.50.39	12.30.07	23.09.35
12/02/2010	9.22.57	20.02.15		27/04/2010	2.10.45	12.50.08	23.29.30	10/07/2010	5.55.48	16.35.17		22/09/2010	9.49.04	20.28.32	
13/02/2010	6.41.33	17.20.51		28/04/2010	10.08.53	20.48.15		11/07/2010	3.14.45	13.54.14		23/09/2010	7.07.59	17.47.27	
14/02/2010	4.00.09	14.39.27		29/04/2010	7.27.38	18.07.00		12/07/2010	0.33.42	11.13.11	21.52.40	24/09/2010	4.26.55	15.06.24	
15/02/2010	1.18.45	11.58.03	22.37.21	30/04/2010	4.46.23	15.25.46		13/07/2010	8.32.09	19.11.37		25/09/2010	1.45.52	12.25.20	23.04.48
16/02/2010	9.16.39	19.55.57		01/05/2010	2.05.09	12.44.31	23.23.54	14/07/2010	5.51.05	16.30.34		26/09/2010	9.44.16	20.23.43	
17/02/2010	6.35.15	17.14.33		02/05/2010	10.03.17	20.42.40		15/07/2010	3.10.03	13.49.32		27/09/2010	7.03.11	17.42.39	
18/02/2010	3.53.51	14.33.09		03/05/2010	7.22.03	18.01.26		16/07/2010	0.29.00	11.08.29	21.47.58	28/09/2010	4.22.07	15.01.35	
19/02/2010	1.12.26	11.51.45	22.31.03	04/05/2010	4.40.49	15.20.13		17/07/2010	8.27.27	19.06.55		29/09/2010	1.41.02	12.20.30	22.59.58
20/02/2010	9.10.21	19.49.39		05/05/2010	1.59.36	12.38.59	23.18.22	18/07/2010	5.46.24	16.25.53		30/09/2010	9.39.26	20.18.53	
21/02/2010	6.28.57	17.08.15		06/05/2010	9.57.46	20.37.09		19/07/2010	3.05.22	13.44.51		01/10/2010	6.58.21	17.37.48	
22/02/2010	3.47.32	14.26.50		07/05/2010	7.16.33	17.55.56		20/07/2010	0.24.20	11.03.49	21.43.17	02/10/2010	4.17.16	14.56.44	
23/02/2010	1.06.09	11.45.27	22.24.45	08/05/2010	4.35.20	15.14.43		21/07/2010	8.22.46	19.02.15		03/10/2010	1.36.11	12.15.39	22.55.06
24/02/2010	9.04.03	19.43.21		09/05/2010	1.54.07	12.33.31	23.12.54	22/07/2010	5.41.44	16.21.13		04/10/2010	9.34.33	20.14.01	
25/02/2010	6.22.39	17.01.57		10/05/2010	9.52.18	20.31.42		23/07/2010	3.00.42	13.40.11		05/10/2010	6.53.29	17.32.56	
26/02/2010	3.41.15	14.20.33		11/05/2010	7.11.06	17.50.30		24/07/2010	0.19.40	10.59.09	21.38.38	06/10/2010	4.12.23	14.51.51	
27/02/2010	0.59.51	11.39.09	22.18.27	12/05/2010	4.29.54	15.09.18		25/07/2010	8.18.06	18.57.35		07/10/2010	1.31.18	12.10.46	22.50.13
28/02/2010	8.57.45	19.37.03		13/05/2010	1.48.42	12.28.06	23.07.30	26/07/2010	5.37.04	16.16.33		08/10/2010	9.29.40	20.09.07	
01/03/2010	6.16.21	16.55.40		14/05/2010	9.46.54	20.26.18		27/07/2010	2.56.02	13.35.31		09/10/2010	6.48.34	17.28.02	
02/03/2010	3.34.58	14.14.16		15/05/2010	7.05.42	17.45.07		28/07/2010	0.15.01	10.54.30	21.33.58	10/10/2010	4.07.29	14.46.56	
03/03/2010	0.53.34	11.32.52	22.12.11	16/05/2010	4.24.31	15.03.56		29/07/2010	8.13.27	18.52.56		11/10/2010	1.26.23	12.05.50	22.45.17
04/03/2010	8.51.29	19.30.47		17/05/2010	1.43.20	12.22.45	23.02.09	30/07/2010	5.32.25	16.11.55		12/10/2010	9.24.44	20.04.11	
05/03/2010	6.10.05	16.49.23		18/05/2010	9.41.34	20.20.58		31/07/2010	2.51.24	13.30.53		13/10			



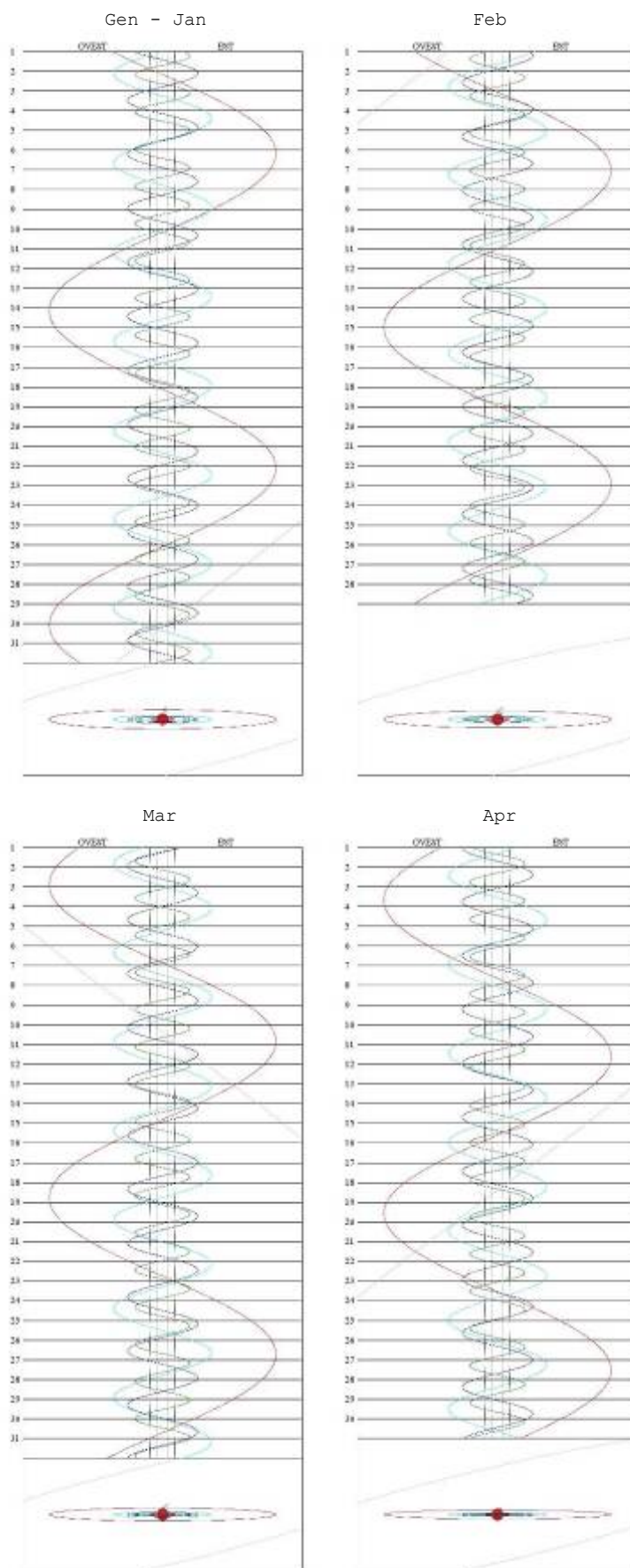
Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian	Date	Zero meridian	Zero meridian	Zero meridian
24/10/2010	9.09.43	19.49.09		11/11/2010	3.26.46	14.06.11		29/11/2010	8.22.18	19.01.42		17/12/2010	2.37.26	13.16.48	23.56.10
25/10/2010	6.28.35	17.08.02		12/11/2010	0.45.36	11.25.01	22.04.26	30/11/2010	5.41.05	16.20.28		18/12/2010	10.35.32	21.14.54	
26/10/2010	3.47.28	14.26.54		13/11/2010	8.43.51	19.23.15		01/12/2010	2.59.52	13.39.15		19/12/2010	7.54.16	18.33.37	
27/10/2010	1.06.20	11.45.46	22.25.12	14/11/2010	6.02.40	16.42.05		02/12/2010	0.18.38	10.58.01	21.37.25	20/12/2010	5.12.59	15.52.21	
28/10/2010	9.04.38	19.44.04		15/11/2010	3.21.29	14.00.54		03/12/2010	8.16.48	18.56.11		21/12/2010	2.31.42	13.11.04	23.50.26
29/10/2010	6.23.30	17.02.56		16/11/2010	0.40.18	11.19.43	21.59.07	04/12/2010	5.35.34	16.14.57		22/12/2010	10.29.47	21.09.09	
30/10/2010	3.42.22	14.21.47		17/11/2010	8.38.32	19.17.56		05/12/2010	2.54.20	13.33.43		23/12/2010	7.48.30	18.27.52	
31/10/2010	1.01.13	11.40.39	22.20.04	18/11/2010	5.57.20	16.36.45		06/12/2010	0.13.06	10.52.29	21.31.51	24/12/2010	5.07.13	15.46.34	
01/11/2010	8.59.30	19.38.56		19/11/2010	3.16.09	13.55.33		07/12/2010	8.11.14	18.50.37		25/12/2010	2.25.56	13.05.17	23.44.38
02/11/2010	6.18.21	16.57.47		20/11/2010	0.34.58	11.14.22	21.53.46	08/12/2010	5.30.00	16.09.22		26/12/2010	10.23.59	21.03.21	
03/11/2010	3.37.13	14.16.38		21/11/2010	8.33.10	19.12.34		09/12/2010	2.48.45	13.28.08		27/12/2010	7.42.42	18.22.03	
04/11/2010	0.56.03	11.35.29	22.14.54	22/11/2010	5.51.58	16.31.22		10/12/2010	0.07.30	10.46.53	21.26.15	28/12/2010	5.01.24	15.40.45	
05/11/2010	8.54.20	19.33.45		23/11/2010	3.10.46	13.50.10		11/12/2010	8.05.38	18.45.00		29/12/2010	2.20.06	12.59.27	23.38.48
06/11/2010	6.13.10	16.52.36		24/11/2010	0.29.34	11.08.58	21.48.22	12/12/2010	5.24.22	16.03.45		30/12/2010	10.18.09	20.57.30	
07/11/2010	3.32.01	14.11.26		25/11/2010	8.27.46	19.07.09		13/12/2010	2.43.07	13.22.29		31/12/2010	7.36.50	18.16.11	
08/11/2010	0.50.51	11.30.16	22.09.41	26/11/2010	5.46.33	16.25.57		14/12/2010	0.01.52	10.41.14	21.20.36				
09/11/2010	8.49.07	19.28.32		27/11/2010	3.05.20	13.44.44		15/12/2010	7.59.58	18.39.20					
10/11/2010	6.07.57	16.47.21		28/11/2010	0.24.08	11.03.31	21.42.55	16/12/2010	5.18.42	15.58.04					

Orari in T.U. in cui transita il Meridiano Centrale

Date in the format dd/mm/yyyy

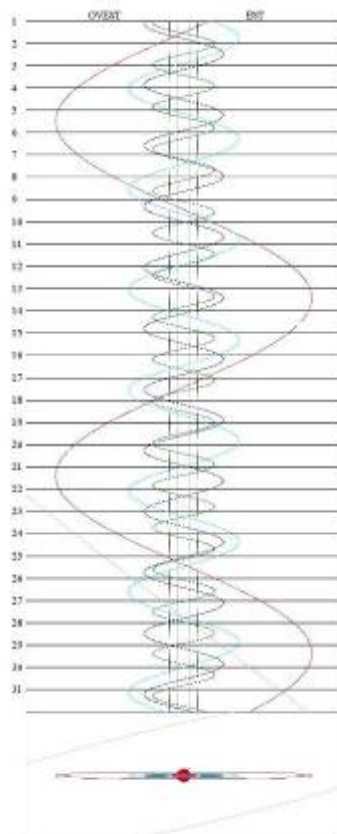
TIMES IN U.T.

# POSIZIONE DEI SATELLITI DI SATURNO POSITION OF THE SATELLITES OF SATURN

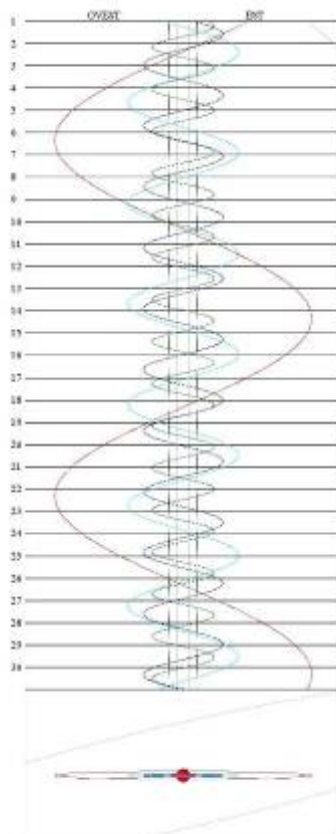


In verde Tethys, in blu Dione, in azzurro Rhea, in rosso Titano, in grigio Japetus  
In green Tethys, in blue Dione, in light blue Rhea, in red Titano, in black Japetus

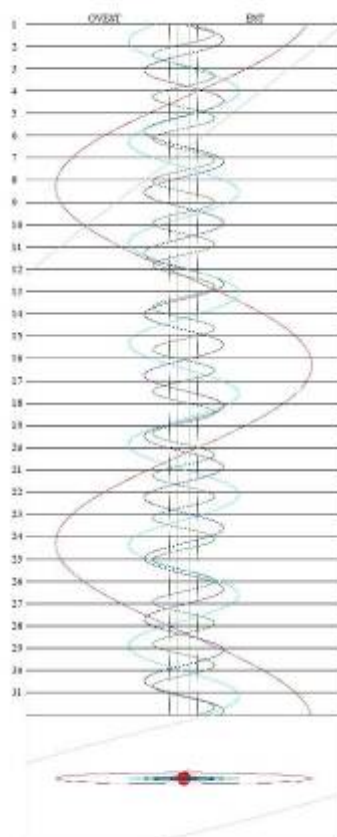
Mag - May



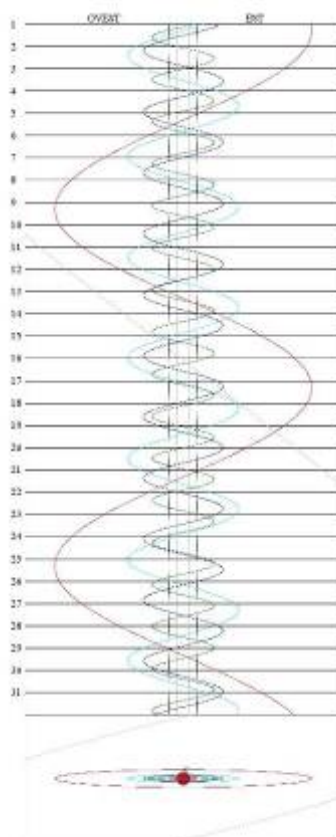
Giu - Jun



Lug - Jul



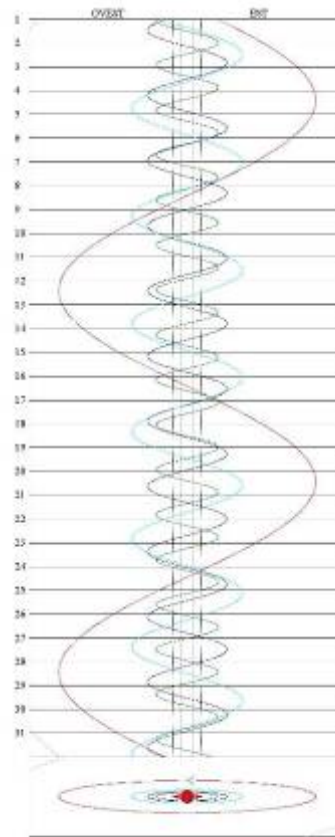
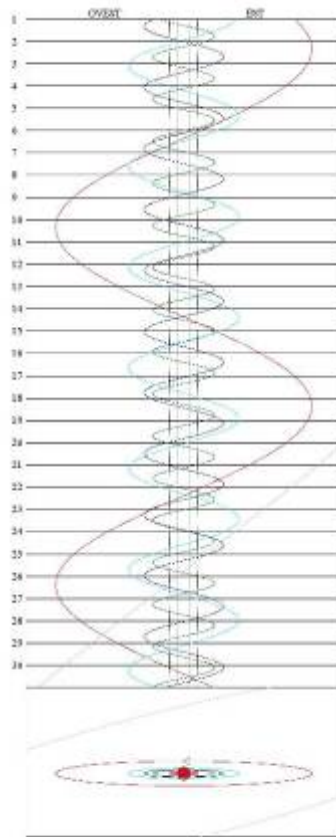
Ago - Aug



In verde Tethys, in blu Dione, in azzurro Rhea, in rosso Titano, in grigio Japetus  
In green Tethys, in blue Dione, in light blue Rhea, in red Titano, in black Japetus

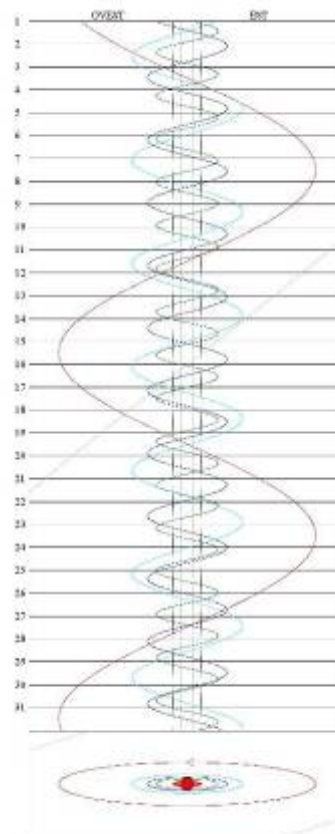
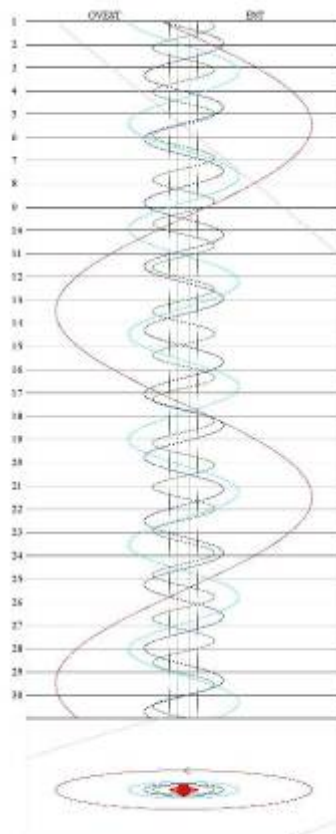
Set - Sep

Ott - Oct



Nov

Dic - Dec



In verde Tethys, in blu Dione, in azzurro Rhea, in rosso Titano, in grigio Japetus  
In green Tethys, in blue Dione, in light blue Rhea, in red Titano, in black Japetus

# EFFEMERIDI DI URANO - EPHEMERIDES OF URANUS

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
01/01/2010	23h 35m 48.22s	-03° 25' 41.7"	20.09691	20.368419	169.40	72.6	3.4	5.9	11.11	17.01	22.50
02/01/2010	23h 35m 53.82s	-03° 25' 03.1"	20.09690	20.384868	169.54	71.6	3.4	5.9	11.07	16.57	22.47
03/01/2010	23h 35m 59.59s	-03° 24' 23.5"	20.09689	20.401225	169.67	70.7	3.4	5.9	11.03	16.53	22.43
04/01/2010	23h 36m 05.52s	-03° 23' 42.8"	20.09687	20.417486	169.81	69.7	3.4	5.9	10.59	16.49	22.39
05/01/2010	23h 36m 11.62s	-03° 23' 01.1"	20.09686	20.433646	169.94	68.7	3.4	5.9	10.55	16.45	22.35
06/01/2010	23h 36m 17.88s	-03° 22' 18.3"	20.09685	20.449701	170.08	67.7	3.4	5.9	10.51	16.41	22.31
07/01/2010	23h 36m 24.31s	-03° 21' 34.4"	20.09683	20.465646	170.21	66.7	3.4	5.9	10.48	16.38	22.28
08/01/2010	23h 36m 30.90s	-03° 20' 49.5"	20.09682	20.481476	170.34	65.7	3.4	5.9	10.44	16.34	22.24
09/01/2010	23h 36m 37.66s	-03° 20' 03.5"	20.09681	20.497187	170.47	64.7	3.4	5.9	10.40	16.30	22.20
10/01/2010	23h 36m 44.58s	-03° 19' 16.5"	20.09679	20.512774	170.60	63.7	3.4	5.9	10.36	16.26	22.16
11/01/2010	23h 36m 51.67s	-03° 18' 28.5"	20.09678	20.528231	170.73	62.7	3.4	5.9	10.32	16.22	22.13
12/01/2010	23h 36m 58.91s	-03° 17' 39.5"	20.09677	20.543556	170.86	61.8	3.4	5.9	10.28	16.19	22.09
13/01/2010	23h 37m 06.32s	-03° 16' 49.4"	20.09676	20.558742	170.98	60.8	3.4	5.9	10.24	16.15	22.05
14/01/2010	23h 37m 13.87s	-03° 15' 58.4"	20.09674	20.573784	171.11	59.8	3.4	5.9	10.20	16.11	22.01
15/01/2010	23h 37m 21.58s	-03° 15' 06.4"	20.09673	20.588680	171.23	58.8	3.4	5.9	10.17	16.07	21.58
16/01/2010	23h 37m 29.44s	-03° 14' 13.5"	20.09672	20.603423	171.35	57.8	3.4	5.9	10.13	16.03	21.54
17/01/2010	23h 37m 37.44s	-03° 13' 19.7"	20.09670	20.618011	171.47	56.8	3.4	5.9	10.09	16.00	21.50
18/01/2010	23h 37m 45.59s	-03° 12' 24.9"	20.09669	20.632437	171.59	55.9	3.4	5.9	10.05	15.56	21.46
19/01/2010	23h 37m 53.87s	-03° 11' 29.3"	20.09668	20.646699	171.71	54.9	3.4	5.9	10.01	15.52	21.43
20/01/2010	23h 38m 02.30s	-03° 10' 32.8"	20.09666	20.660792	171.83	53.9	3.4	5.9	9.57	15.48	21.39
21/01/2010	23h 38m 10.87s	-03° 09' 35.4"	20.09665	20.674712	171.95	52.9	3.4	5.9	9.54	15.44	21.35
22/01/2010	23h 38m 19.58s	-03° 08' 37.1"	20.09663	20.688456	172.06	51.9	3.4	5.9	9.50	15.41	21.31
23/01/2010	23h 38m 28.43s	-03° 07' 37.9"	20.09662	20.702018	172.17	51.0	3.4	5.9	9.46	15.37	21.28
24/01/2010	23h 38m 37.41s	-03° 06' 37.9"	20.09661	20.715397	172.28	50.0	3.4	5.9	9.42	15.33	21.24
25/01/2010	23h 38m 46.53s	-03° 05' 37.1"	20.09659	20.728589	172.39	49.0	3.4	5.9	9.38	15.29	21.20
26/01/2010	23h 38m 55.78s	-03° 04' 35.4"	20.09658	20.741590	172.50	48.0	3.4	5.9	9.34	15.25	21.17
27/01/2010	23h 39m 05.15s	-03° 03' 32.9"	20.09657	20.754396	172.61	47.1	3.4	5.9	9.30	15.22	21.13
28/01/2010	23h 39m 14.66s	-03° 02' 29.6"	20.09655	20.767006	172.71	46.1	3.4	5.9	9.27	15.18	21.09
29/01/2010	23h 39m 24.28s	-03° 01' 25.6"	20.09654	20.779415	172.82	45.1	3.4	5.9	9.23	15.14	21.05
30/01/2010	23h 39m 34.02s	-03° 00' 20.9"	20.09652	20.791622	172.92	44.1	3.4	5.9	9.19	15.10	21.02
31/01/2010	23h 39m 43.87s	-02° 59' 15.4"	20.09651	20.803623	173.02	43.2	3.4	5.9	9.15	15.07	20.58
01/02/2010	23h 39m 53.84s	-02° 58' 09.3"	20.09650	20.815416	173.12	42.2	3.4	5.9	9.11	15.03	20.54
02/02/2010	23h 40m 03.91s	-02° 57' 02.4"	20.09648	20.826997	173.21	41.2	3.4	5.9	9.07	14.59	20.51
03/02/2010	23h 40m 14.10s	-02° 55' 54.9"	20.09647	20.838363	173.31	40.3	3.4	5.9	9.04	14.55	20.47
04/02/2010	23h 40m 24.39s	-02° 54' 46.7"	20.09645	20.849512	173.40	39.3	3.4	5.9	9.00	14.52	20.43
05/02/2010	23h 40m 34.80s	-02° 53' 37.8"	20.09644	20.860440	173.49	38.3	3.4	5.9	8.56	14.48	20.40
06/02/2010	23h 40m 45.31s	-02° 52' 28.2"	20.09643	20.871145	173.58	37.4	3.4	5.9	8.52	14.44	20.36
07/02/2010	23h 40m 55.93s	-02° 51' 17.9"	20.09641	20.881622	173.67	36.4	3.4	5.9	8.48	14.40	20.32
08/02/2010	23h 41m 06.65s	-02° 50' 07.1"	20.09640	20.891870	173.75	35.4	3.4	5.9	8.45	14.36	20.29
09/02/2010	23h 41m 17.47s	-02° 48' 55.6"	20.09638	20.901884	173.84	34.5	3.4	5.9	8.41	14.33	20.25
10/02/2010	23h 41m 28.38s	-02° 47' 43.5"	20.09637	20.911663	173.92	33.5	3.4	5.9	8.37	14.29	20.21
11/02/2010	23h 41m 39.39s	-02° 46' 30.9"	20.09635	20.921203	174.00	32.6	3.4	5.9	8.33	14.25	20.17
12/02/2010	23h 41m 50.48s	-02° 45' 17.7"	20.09634	20.930502	174.07	31.6	3.4	5.9	8.29	14.22	20.14
13/02/2010	23h 42m 01.66s	-02° 44' 04.0"	20.09633	20.939557	174.15	30.6	3.3	5.9	8.25	14.18	20.10
14/02/2010	23h 42m 12.92s	-02° 42' 49.8"	20.09631	20.948366	174.22	29.7	3.3	5.9	8.22	14.14	20.06
15/02/2010	23h 42m 24.27s	-02° 41' 35.0"	20.09630	20.956925	174.29	28.7	3.3	5.9	8.18	14.10	20.03
16/02/2010	23h 42m 35.69s	-02° 40' 19.9"	20.09628	20.965234	174.36	27.8	3.3	5.9	8.14	14.07	19.59
17/02/2010	23h 42m 47.18s	-02° 39' 04.2"	20.09627	20.973290	174.43	26.8	3.3	5.9	8.10	14.03	19.55
18/02/2010	23h 42m 58.76s	-02° 37' 48.1"	20.09625	20.981090	174.49	25.8	3.3	5.9	8.06	13.59	19.52
19/02/2010	23h 43m 10.40s	-02° 36' 31.5"	20.09624	20.988633	174.56	24.9	3.3	5.9	8.03	13.55	19.48
20/02/2010	23h 43m 22.12s	-02° 35' 14.6"	20.09622	20.995918	174.62	23.9	3.3	5.9	7.59	13.52	19.44
21/02/2010	23h 43m 33.90s	-02° 33' 57.2"	20.09621	21.002942	174.68	23.0	3.3	5.9	7.55	13.48	19.41
22/02/2010	23h 43m 45.75s	-02° 32' 39.4"	20.09619	21.009705	174.73	22.0	3.3	5.9	7.51	13.44	19.37
23/02/2010	23h 43m 57.67s	-02° 31' 21.2"	20.09618	21.016204	174.79	21.1	3.3	5.9	7.47	13.40	19.34
24/02/2010	23h 44m 09.64s	-02° 30' 02.6"	20.09616	21.022439	174.84	20.1	3.3	5.9	7.43	13.37	19.30
25/02/2010	23h 44m 21.67s	-02° 28' 43.8"	20.09615	21.028409	174.89	19.2	3.3	5.9	7.40	13.33	19.26
26/02/2010	23h 44m 33.75s	-02° 27' 24.6"	20.09613	21.034112	174.94	18.2	3.3	5.9	7.36	13.29	19.23
27/02/2010	23h 44m 45.88s	-02° 26' 05.2"	20.09612	21.039549	174.98	17.3	3.3	5.9	7.32	13.25	19.19
28/02/2010	23h 44m 58.05s	-02° 24' 45.5"	20.09610	21.044717	175.02	16.3	3.3	5.9	7.28	13.22	19.15
01/03/2010	23h 45m 10.26s	-02° 23' 25.6"	20.09609	21.049617	175.06	15.4	3.3	5.9	7.24	13.18	19.12
02/03/2010	23h 45m 22.51s	-02° 22' 05.4"	20.09607	21.054246	175.10	14.4	3.3	5.9	7.21	13.14	19.08
03/03/2010	23h 45m 34.80s	-02° 20' 45.0"	20.09606	21.058605	175.14	13.5	3.3	5.9	7.17	13.11	19.04
04/03/2010	23h 45m 47.14s	-02° 19' 24.4"	20.09604	21.062693	175.17	12.5	3.3	5.9	7.13	13.07	19.01
05/03/2010	23h 45m 59.51s	-02° 18' 03.5"	20.09603	21.066507	175.20	11.6	3.3	5.9	7.09	13.03	18.57
06/03/2010	23h 46m 11.92s	-02° 16' 42.5"	20.09601	21.070047	175.23	10.7	3.3	5.9	7.05	12.59	18.53
07/03/2010	23h 46m 24.37s	-02° 15' 21.2"	20.09600	21.073313	175.26	9.7	3.3	5.9	7.02	12.56	18.50
08/03/2010	23h 46m 36.84s	-02° 13' 59.8"	20.09598	21.076302	175.29	8.8	3.3	5.9	6.58	12.52	18.46
09/03/2010	23h 46m 49.34s	-02° 12' 38.2"	20.09596	21.079014	175.31	7.8	3.3	5.9	6.54	12.48	18.42
10/03/2010	23h 47m 01.86s	-02° 11' 16.6"	20.09595	21.081449	175.33	6.9	3.3	5.9	6.50	12.44	18.39
11/03/2010	23h 47m 14.40s	-02° 09' 54.8"	20.09593	21.083605	175.35	5.9	3.3	5.9	6.46	12.41	18.35
12/03/2010	23h 47m 26.95s	-02° 08' 33.0"	20.09592	21.085483	175.36	5.0	3.3	5.9	6.43	12.37	18.31
13/03/2010	23h 47m 39.52s	-02° 07' 11.1"	20.09590	21.087081	175.38	4.1	3.3	5.9	6.39	12.33	18.28
14/03/2010	23h 47m 52.10s	-02° 05' 49.2"	20.09589	21.088399	175.39	3.1	3.3	5.9	6.35	12.30	18.24
15/03/2010	23h 48m 04.69s	-02° 04' 27.3"	20.09587	21.089437	175.40	2.2	3.3	5.9	6.31	12.26	18.21
16/03/2010	23h 48m 17.29s	-02° 03' 05.4"	20.09585	21.090194	175.40	1.3	3.3	5.9	6.27	12.22	18.17
17/03/2010	23h 48m 29.89s	-02° 01' 43.8"	20.09584	21.090672	175.41	0.6	3.3	5.9	6.24	12.18	18.13
18/03/2010	23h 48m 42.45s	-02° 00' 21.9"	20.09582	21.090869	175.41	0.9	3.3	5.9	6.20	12.15	18.10
19/03/2010	23h 48m 55.05s	-01° 58' 59.8"	20.09581	21.090786	175.41	1.7	3.3	5.9	6.16	12.11	18.06
20/03/2010	23h 49m 07.65s	-01° 57' 37.9"	20.09579	21.090424	175.40	2.6	3.3	5.9	6.12	12.07	18.02
21/03/2010	23h 49m 20.24s	-01° 56' 16.1"	20.09577	21.089783	175.40	3.5	3.3	5.9	6.08	12.03	17.59
22/03/2010	23h 49m 32.83s	-01° 54' 54.3"	20.09576	21.088864	175.39	4.5	3.3	5.9	6.04	12.00	17.55
23/03/2010	23h 49m 45.41s	-01° 53' 32.7"	20.09574	21.087668	175.38	5.4	3.3	5.9	6.01	11.56	17.51
24/03/2010	23h 49m 57.97s	-01° 52' 11.2"	2								



Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
09/04/2010	23h 53m 14.83s	-01° 30' 58.6"	20.09546	21.025866	174.87	21.2	3.3	5.9	4.56	10.53	16.49
10/04/2010	23h 53m 26.76s	-01° 29' 41.7"	20.09544	21.019851	174.82	22.1	3.3	5.9	4.52	10.49	16.46
11/04/2010	23h 53m 38.63s	-01° 28' 25.3"	20.09543	21.013579	174.76	23.1	3.3	5.9	4.48	10.45	16.42
12/04/2010	23h 53m 50.44s	-01° 27' 09.3"	20.09541	21.007053	174.71	24.0	3.3	5.9	4.45	10.41	16.38
13/04/2010	23h 54m 02.18s	-01° 25' 53.8"	20.09539	21.000273	174.65	24.9	3.3	5.9	4.41	10.38	16.35
14/04/2010	23h 54m 13.86s	-01° 24' 38.7"	20.09538	20.993242	174.60	25.8	3.3	5.9	4.37	10.34	16.31
15/04/2010	23h 54m 25.47s	-01° 23' 24.1"	20.09536	20.985962	174.53	26.8	3.3	5.9	4.33	10.30	16.27
16/04/2010	23h 54m 37.02s	-01° 22' 09.9"	20.09534	20.978435	174.47	27.7	3.3	5.9	4.29	10.27	16.24
17/04/2010	23h 54m 48.49s	-01° 20' 56.2"	20.09532	20.970663	174.41	28.6	3.3	5.9	4.25	10.23	16.20
18/04/2010	23h 54m 59.89s	-01° 19' 43.1"	20.09531	20.962648	174.34	29.5	3.3	5.9	4.22	10.19	16.16
19/04/2010	23h 55m 11.22s	-01° 18' 30.5"	20.09529	20.954394	174.27	30.5	3.3	5.9	4.18	10.15	16.13
20/04/2010	23h 55m 22.46s	-01° 17' 18.4"	20.09527	20.945903	174.20	31.4	3.3	5.9	4.14	10.12	16.09
21/04/2010	23h 55m 33.62s	-01° 16' 06.9"	20.09526	20.937177	174.13	32.3	3.4	5.9	4.10	10.08	16.05
22/04/2010	23h 55m 44.70s	-01° 14' 56.0"	20.09524	20.928220	174.05	33.2	3.4	5.9	4.06	10.04	16.02
23/04/2010	23h 55m 55.68s	-01° 13' 45.7"	20.09522	20.919034	173.98	34.2	3.4	5.9	4.03	10.00	15.98
24/04/2010	23h 56m 06.57s	-01° 12' 36.1"	20.09520	20.909621	173.90	35.1	3.4	5.9	3.99	9.97	15.95
25/04/2010	23h 56m 17.37s	-01° 11' 27.1"	20.09519	20.899986	173.82	36.0	3.4	5.9	3.95	9.93	15.91
26/04/2010	23h 56m 28.07s	-01° 10' 18.7"	20.09517	20.890130	173.74	37.0	3.4	5.9	3.91	9.89	15.87
27/04/2010	23h 56m 38.68s	-01° 09' 11.0"	20.09515	20.880057	173.65	37.9	3.4	5.9	3.87	9.85	15.83
28/04/2010	23h 56m 49.19s	-01° 08' 03.9"	20.09513	20.869768	173.57	38.8	3.4	5.9	3.83	9.82	15.80
29/04/2010	23h 56m 59.61s	-01° 06' 57.5"	20.09512	20.859266	173.48	39.7	3.4	5.9	3.80	9.78	15.76
30/04/2010	23h 57m 09.93s	-01° 05' 51.7"	20.09510	20.848555	173.39	40.6	3.4	5.9	3.76	9.74	15.72
01/05/2010	23h 57m 20.15s	-01° 04' 46.6"	20.09508	20.837636	173.30	41.6	3.4	5.9	3.72	9.70	15.69
02/05/2010	23h 57m 30.27s	-01° 03' 42.2"	20.09506	20.826512	173.21	42.5	3.4	5.9	3.68	9.66	15.65
03/05/2010	23h 57m 40.28s	-01° 02' 38.5"	20.09504	20.815185	173.11	43.4	3.4	5.9	3.64	9.62	15.61
04/05/2010	23h 57m 50.18s	-01° 01' 35.6"	20.09503	20.803659	173.02	44.3	3.4	5.9	3.61	9.59	15.57
05/05/2010	23h 57m 59.97s	-01° 00' 33.4"	20.09501	20.791936	172.92	45.3	3.4	5.9	3.57	9.55	15.54
06/05/2010	23h 58m 09.64s	-00° 59' 32.0"	20.09499	20.780018	172.82	46.2	3.4	5.9	3.53	9.51	15.50
07/05/2010	23h 58m 19.20s	-00° 58' 31.4"	20.09497	20.767910	172.72	47.1	3.4	5.9	3.49	9.47	15.46
08/05/2010	23h 58m 28.63s	-00° 57' 31.6"	20.09495	20.755613	172.62	48.0	3.4	5.9	3.45	9.43	15.43
09/05/2010	23h 58m 37.95s	-00° 56' 32.6"	20.09494	20.743132	172.52	49.0	3.4	5.9	3.41	9.40	15.39
10/05/2010	23h 58m 47.14s	-00° 55' 34.4"	20.09492	20.730468	172.41	49.9	3.4	5.9	3.37	9.36	15.35
11/05/2010	23h 58m 56.22s	-00° 54' 37.1"	20.09490	20.717626	172.30	50.8	3.4	5.9	3.33	9.32	15.32
12/05/2010	23h 59m 05.16s	-00° 53' 40.6"	20.09488	20.704609	172.19	51.7	3.4	5.9	3.29	9.28	15.28
13/05/2010	23h 59m 13.99s	-00° 52' 44.9"	20.09486	20.691421	172.09	52.7	3.4	5.9	3.25	9.24	15.24
14/05/2010	23h 59m 22.69s	-00° 51' 50.0"	20.09484	20.678064	171.97	53.6	3.4	5.9	3.22	9.21	15.21
15/05/2010	23h 59m 31.26s	-00° 50' 56.1"	20.09483	20.664543	171.86	54.5	3.4	5.9	3.18	9.17	15.17
16/05/2010	23h 59m 39.69s	-00° 50' 03.0"	20.09481	20.650862	171.75	55.5	3.4	5.9	3.14	9.13	15.14
17/05/2010	23h 59m 48.00s	-00° 49' 10.7"	20.09479	20.637025	171.63	56.4	3.4	5.9	3.10	9.09	15.10
18/05/2010	23h 59m 56.17s	-00° 48' 19.4"	20.09477	20.623035	171.52	57.3	3.4	5.9	3.06	9.05	15.06
19/05/2010	00h 00m 04.20s	-00° 47' 29.1"	20.09475	20.608898	171.40	58.2	3.4	5.9	3.02	9.02	15.02
20/05/2010	00h 00m 12.08s	-00° 46' 39.7"	20.09473	20.594616	171.28	59.2	3.4	5.9	2.98	8.98	14.98
21/05/2010	00h 00m 19.82s	-00° 45' 51.2"	20.09471	20.580195	171.16	60.1	3.4	5.9	2.94	8.94	14.94
22/05/2010	00h 00m 27.42s	-00° 45' 03.8"	20.09470	20.565638	171.04	61.0	3.4	5.9	2.90	8.90	14.90
23/05/2010	00h 00m 34.86s	-00° 44' 17.3"	20.09468	20.550949	170.92	61.9	3.4	5.9	2.86	8.87	14.87
24/05/2010	00h 00m 42.17s	-00° 43' 31.7"	20.09466	20.536132	170.79	62.9	3.4	5.9	2.82	8.83	14.83
25/05/2010	00h 00m 49.33s	-00° 42' 47.1"	20.09464	20.521191	170.67	63.8	3.4	5.9	2.78	8.79	14.79
26/05/2010	00h 00m 56.34s	-00° 42' 03.5"	20.09462	20.506130	170.54	64.7	3.4	5.9	2.74	8.75	14.75
27/05/2010	00h 01m 03.21s	-00° 41' 20.8"	20.09460	20.490952	170.42	65.7	3.4	5.9	2.70	8.72	14.72
28/05/2010	00h 01m 09.93s	-00° 40' 39.1"	20.09458	20.475662	170.29	66.6	3.4	5.9	2.66	8.68	14.68
29/05/2010	00h 01m 16.50s	-00° 39' 58.5"	20.09456	20.460262	170.16	67.5	3.4	5.9	2.62	8.64	14.64
30/05/2010	00h 01m 22.92s	-00° 39' 18.8"	20.09455	20.444757	170.03	68.4	3.4	5.9	2.58	8.60	14.60
31/05/2010	00h 01m 29.18s	-00° 38' 40.1"	20.09453	20.429151	169.90	69.4	3.4	5.9	2.54	8.56	14.56
01/06/2010	00h 01m 35.29s	-00° 38' 02.5"	20.09451	20.413447	169.77	70.3	3.4	5.9	2.50	8.52	14.52
02/06/2010	00h 01m 41.24s	-00° 37' 25.9"	20.09449	20.397649	169.64	71.2	3.4	5.9	2.46	8.48	14.48
03/06/2010	00h 01m 47.02s	-00° 36' 50.5"	20.09447	20.381761	169.51	72.2	3.4	5.9	2.42	8.44	14.44
04/06/2010	00h 01m 52.64s	-00° 36' 16.0"	20.09445	20.365787	169.38	73.1	3.4	5.9	2.38	8.40	14.40
05/06/2010	00h 01m 58.11s	-00° 35' 42.7"	20.09443	20.349731	169.24	74.0	3.4	5.9	2.34	8.36	14.36
06/06/2010	00h 02m 03.40s	-00° 35' 10.4"	20.09441	20.333598	169.11	75.0	3.4	5.9	2.30	8.32	14.32
07/06/2010	00h 02m 08.54s	-00° 34' 39.2"	20.09439	20.317391	168.97	75.9	3.5	5.9	2.26	8.28	14.28
08/06/2010	00h 02m 13.51s	-00° 34' 09.1"	20.09437	20.301115	168.84	76.8	3.5	5.9	2.22	8.24	14.24
09/06/2010	00h 02m 18.32s	-00° 33' 40.0"	20.09435	20.284775	168.70	77.8	3.5	5.9	2.18	8.20	14.20
10/06/2010	00h 02m 22.96s	-00° 33' 12.1"	20.09433	20.268374	168.57	78.7	3.5	5.8	2.14	8.16	14.16
11/06/2010	00h 02m 27.44s	-00° 32' 45.2"	20.09431	20.251918	168.43	79.6	3.5	5.8	2.10	8.12	14.12
12/06/2010	00h 02m 31.75s	-00° 32' 19.4"	20.09429	20.235411	168.29	80.6	3.5	5.8	2.06	8.08	14.08
13/06/2010	00h 02m 35.89s	-00° 31' 54.7"	20.09428	20.218858	168.15	81.5	3.5	5.8	2.02	8.04	14.04
14/06/2010	00h 02m 39.87s	-00° 31' 31.2"	20.09426	20.202264	168.02	82.5	3.5	5.8	1.98	8.00	14.00
15/06/2010	00h 02m 43.66s	-00° 31' 08.8"	20.09424	20.185634	167.88	83.4	3.5	5.8	1.94	7.96	13.96
16/06/2010	00h 02m 47.29s	-00° 30' 47.5"	20.09422	20.168973	167.74	84.3	3.5	5.8	1.90	7.92	13.92
17/06/2010	00h 02m 50.73s	-00° 30' 27.4"	20.09420	20.152285	167.60	85.3	3.5	5.8	1.86	7.88	13.88
18/06/2010	00h 02m 54.00s	-00° 30' 08.5"	20.09418	20.135576	167.46	86.2	3.5	5.8	1.82	7.84	13.84
19/06/2010	00h 02m 57.09s	-00° 29' 50.7"	20.09416	20.118850	167.32	87.2	3.5	5.8	1.78	7.80	13.80
20/06/2010	00h 03m 00.00s	-00° 29' 34.0"	20.09414	20.102113	167.18	88.1	3.5	5.8	1.74	7.76	13.76
21/06/2010	00h 03m 02.75s	-00° 29' 18.5"	20.09412	20.085367	167.04	89.0	3.5	5.8	1.70	7.72	13.72
22/06/2010	00h 03m 05.32s	-00° 29' 04.1"	20.09410	20.068618	166.91	90.0	3.5	5.8	1.66	7.68	13.68
23/06/2010	00h 03m 07.71s	-00° 28' 50.9"	20.09408	20.051871	166.77	90.9	3.5	5.8	1.62	7.64	13.64
24/06/2010	00h 03m 09.94s	-00° 28' 38.7"	20.09406	20.035129	166.63	91.9	3.5	5.8	1.58	7.60	13.60
25/06/2010	00h 03m 11.99s	-00° 28' 27.7"	20.09404	20.018397	166.49	92.8	3.5	5.8	1.54	7.56	13.56
26/06/2010	00h 03m 13.86s	-00° 28' 17.9"	20.09402	20.001680	166.35	93.8	3.5	5.8	1.50	7.52	13.52
27/06/2010	00h 03m 15.56s	-00° 28' 09.1"	20.09400	19.984980	166.21	94.7	3.5	5.8	1.46	7.48	13.48
28/06/2010	00h 03m 17.08s	-00° 28' 01.6"	20.09398	19.968304	166.07	95.7	3.5	5.8	1.42	7.44	13.44
29/06/2010	00h 03m 18.42s	-00° 27' 55.2"	20.09396	19.951655	165.93	96.6	3.5	5.8	1.38	7.40	13.40
30/06/2010	00h 03m 19.58s	-00° 27' 50.0"	20.09394	19.935037	165.79	97.6	3.5	5.8	1.34	7.36	13.36
01/07/2010	00h 03m 20.57s										

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
22/07/2010	00h 03m 00.40s	-00° 30' 44.5"	20.09348	19.586867	162.90	118.6	3.6	5.8	22.09	4.13	10.14
23/07/2010	00h 02m 57.55s	-00° 31' 05.1"	20.09346	19.572269	162.78	119.6	3.6	5.8	22.05	4.09	10.10
24/07/2010	00h 02m 54.53s	-00° 31' 26.8"	20.09344	19.557814	162.66	120.6	3.6	5.8	22.01	4.05	10.06
25/07/2010	00h 02m 51.35s	-00° 31' 49.6"	20.09341	19.543505	162.54	121.5	3.6	5.8	21.57	4.01	10.02
26/07/2010	00h 02m 48.00s	-00° 32' 13.4"	20.09339	19.529346	162.42	122.5	3.6	5.8	21.53	3.57	9.58
27/07/2010	00h 02m 44.49s	-00° 32' 38.2"	20.09337	19.515341	162.30	123.5	3.6	5.8	21.49	3.53	9.54
28/07/2010	00h 02m 40.82s	-00° 33' 04.1"	20.09335	19.501494	162.19	124.4	3.6	5.8	21.45	3.49	9.50
29/07/2010	00h 02m 36.99s	-00° 33' 31.0"	20.09333	19.487809	162.08	125.4	3.6	5.8	21.41	3.45	9.46
30/07/2010	00h 02m 32.99s	-00° 33' 58.9"	20.09331	19.474291	161.96	126.4	3.6	5.8	21.38	3.41	9.41
31/07/2010	00h 02m 28.85s	-00° 34' 27.8"	20.09329	19.460942	161.85	127.4	3.6	5.8	21.34	3.37	9.37
01/08/2010	00h 02m 24.54s	-00° 34' 57.7"	20.09326	19.447768	161.74	128.3	3.6	5.8	21.30	3.33	9.33
02/08/2010	00h 02m 20.09s	-00° 35' 28.6"	20.09324	19.434773	161.63	129.3	3.6	5.8	21.26	3.29	9.29
03/08/2010	00h 02m 15.48s	-00° 36' 00.4"	20.09322	19.421960	161.53	130.3	3.6	5.8	21.22	3.25	9.25
04/08/2010	00h 02m 10.73s	-00° 36' 33.1"	20.09320	19.409334	161.42	131.3	3.6	5.8	21.18	3.21	9.21
05/08/2010	00h 02m 05.84s	-00° 37' 06.8"	20.09318	19.396898	161.32	132.3	3.6	5.8	21.14	3.17	9.17
06/08/2010	00h 02m 00.80s	-00° 37' 41.4"	20.09316	19.384657	161.22	133.2	3.6	5.8	21.10	3.13	9.13
07/08/2010	00h 01m 55.61s	-00° 38' 16.8"	20.09313	19.372616	161.12	134.2	3.6	5.8	21.06	3.09	9.09
08/08/2010	00h 01m 50.29s	-00° 38' 53.2"	20.09311	19.360778	161.02	135.2	3.6	5.8	21.02	3.05	9.05
09/08/2010	00h 01m 44.82s	-00° 39' 30.5"	20.09309	19.349147	160.92	136.2	3.6	5.8	20.58	3.01	9.01
10/08/2010	00h 01m 39.21s	-00° 40' 08.6"	20.09307	19.337729	160.83	137.2	3.6	5.8	20.54	2.57	8.57
11/08/2010	00h 01m 33.45s	-00° 40' 47.7"	20.09305	19.326526	160.73	138.2	3.6	5.8	20.50	2.53	8.53
12/08/2010	00h 01m 27.56s	-00° 41' 27.6"	20.09302	19.315542	160.64	139.1	3.6	5.8	20.46	2.49	8.49
13/08/2010	00h 01m 21.54s	-00° 42' 08.3"	20.09300	19.304783	160.55	140.1	3.6	5.8	20.42	2.45	8.45
14/08/2010	00h 01m 15.39s	-00° 42' 49.8"	20.09298	19.294250	160.47	141.1	3.6	5.8	20.38	2.41	8.41
15/08/2010	00h 01m 09.11s	-00° 43' 32.1"	20.09296	19.283947	160.38	142.1	3.6	5.8	20.34	2.37	8.37
16/08/2010	00h 01m 02.72s	-00° 44' 15.2"	20.09293	19.273877	160.30	143.1	3.6	5.8	20.30	2.33	8.33
17/08/2010	00h 00m 56.21s	-00° 44' 58.9"	20.09291	19.264044	160.21	144.1	3.6	5.7	20.26	2.29	8.28
18/08/2010	00h 00m 49.58s	-00° 45' 43.4"	20.09289	19.254450	160.13	145.1	3.6	5.7	20.22	2.25	8.24
19/08/2010	00h 00m 42.84s	-00° 46' 28.6"	20.09287	19.245099	160.06	146.1	3.6	5.7	20.18	2.21	8.20
20/08/2010	00h 00m 35.98s	-00° 47' 14.5"	20.09284	19.235992	159.98	147.1	3.6	5.7	20.14	2.17	8.16
21/08/2010	00h 00m 29.01s	-00° 48' 01.0"	20.09282	19.227132	159.91	148.1	3.6	5.7	20.10	2.13	8.12
22/08/2010	00h 00m 21.94s	-00° 48' 48.3"	20.09280	19.218523	159.84	149.1	3.6	5.7	20.06	2.09	8.08
23/08/2010	00h 00m 14.76s	-00° 49' 36.2"	20.09278	19.210167	159.77	150.1	3.7	5.7	20.02	2.05	8.04
24/08/2010	00h 00m 07.47s	-00° 50' 24.7"	20.09275	19.202066	159.70	151.0	3.7	5.7	19.58	2.01	8.00
25/08/2010	00h 00m 00.08s	-00° 51' 13.8"	20.09273	19.194223	159.63	152.0	3.7	5.7	19.54	1.57	7.56
26/08/2010	23h 59m 52.60s	-00° 52' 03.6"	20.09271	19.186640	159.57	153.0	3.7	5.7	19.50	1.53	7.52
27/08/2010	23h 59m 45.02s	-00° 52' 53.9"	20.09269	19.179321	159.51	154.0	3.7	5.7	19.46	1.49	7.47
28/08/2010	23h 59m 37.35s	-00° 53' 44.8"	20.09266	19.172266	159.45	155.0	3.7	5.7	19.42	1.45	7.43
29/08/2010	23h 59m 29.60s	-00° 54' 36.1"	20.09264	19.165480	159.39	156.0	3.7	5.7	19.38	1.40	7.39
30/08/2010	23h 59m 21.76s	-00° 55' 28.0"	20.09262	19.158964	159.34	157.0	3.7	5.7	19.34	1.36	7.35
31/08/2010	23h 59m 13.84s	-00° 56' 20.4"	20.09259	19.152721	159.29	158.0	3.7	5.7	19.30	1.32	7.31
01/09/2010	23h 59m 05.85s	-00° 57' 13.2"	20.09257	19.146753	159.24	159.0	3.7	5.7	19.26	1.28	7.27
02/09/2010	23h 58m 57.78s	-00° 58' 06.4"	20.09255	19.141062	159.19	160.1	3.7	5.7	19.22	1.24	7.23
03/09/2010	23h 58m 49.64s	-00° 59' 00.0"	20.09253	19.135652	159.15	161.1	3.7	5.7	19.18	1.20	7.19
04/09/2010	23h 58m 41.44s	-00° 59' 54.1"	20.09250	19.130524	159.10	162.1	3.7	5.7	19.14	1.16	7.15
05/09/2010	23h 58m 33.16s	-01° 00' 48.5"	20.09248	19.125680	159.06	163.1	3.7	5.7	19.10	1.12	7.10
06/09/2010	23h 58m 24.83s	-01° 01' 43.3"	20.09246	19.121123	159.03	164.1	3.7	5.7	19.06	1.08	7.06
07/09/2010	23h 58m 16.42s	-01° 02' 38.5"	20.09243	19.116855	158.99	165.1	3.7	5.7	19.02	1.04	7.02
08/09/2010	23h 58m 07.96s	-01° 03' 34.0"	20.09241	19.112878	158.96	166.1	3.7	5.7	18.58	1.00	6.58
09/09/2010	23h 57m 59.45s	-01° 04' 29.9"	20.09239	19.109193	158.93	167.1	3.7	5.7	18.54	0.56	6.54
10/09/2010	23h 57m 50.89s	-01° 05' 25.9"	20.09236	19.105803	158.90	168.1	3.7	5.7	18.50	0.52	6.50
11/09/2010	23h 57m 42.28s	-01° 06' 22.2"	20.09234	19.102708	158.87	169.1	3.7	5.7	18.46	0.48	6.46
12/09/2010	23h 57m 33.64s	-01° 07' 18.7"	20.09232	19.099909	158.85	170.1	3.7	5.7	18.41	0.44	6.42
13/09/2010	23h 57m 24.96s	-01° 08' 15.4"	20.09229	19.097408	158.83	171.1	3.7	5.7	18.37	0.39	6.37
14/09/2010	23h 57m 16.26s	-01° 09' 12.2"	20.09227	19.095205	158.81	172.1	3.7	5.7	18.33	0.35	6.33
15/09/2010	23h 57m 07.53s	-01° 10' 09.1"	20.09224	19.093301	158.79	173.2	3.7	5.7	18.29	0.31	6.29
16/09/2010	23h 56m 58.77s	-01° 11' 06.2"	20.09222	19.091696	158.78	174.2	3.7	5.7	18.25	0.27	6.25
17/09/2010	23h 56m 49.99s	-01° 12' 03.3"	20.09220	19.090390	158.77	175.2	3.7	5.7	18.21	0.23	6.21
18/09/2010	23h 56m 41.19s	-01° 13' 00.5"	20.09217	19.089384	158.76	176.1	3.7	5.7	18.17	0.19	6.17
19/09/2010	23h 56m 32.37s	-01° 13' 57.8"	20.09215	19.088679	158.76	177.1	3.7	5.7	18.13	0.15	6.13
20/09/2010	23h 56m 23.55s	-01° 14' 55.1"	20.09213	19.088274	158.75	178.1	3.7	5.7	18.09	0.11	6.08
21/09/2010	23h 56m 14.71s	-01° 15' 52.4"	20.09210	19.088170	158.75	178.8	3.7	5.7	18.05	0.07	6.04
22/09/2010	23h 56m 05.86s	-01° 16' 49.8"	20.09208	19.088366	158.75	179.0	3.7	5.7	18.01	0.03	6.00
23/09/2010	23h 55m 57.02s	-01° 17' 47.0"	20.09205	19.088863	158.76	178.4	3.7	5.7	17.57	23.55	5.56
24/09/2010	23h 55m 48.18s	-01° 18' 44.2"	20.09203	19.089661	158.76	177.5	3.7	5.7	17.53	23.51	5.52
25/09/2010	23h 55m 39.34s	-01° 19' 41.3"	20.09201	19.090760	158.77	176.5	3.7	5.7	17.49	23.46	5.48
26/09/2010	23h 55m 30.52s	-01° 20' 38.3"	20.09198	19.092160	158.78	175.5	3.7	5.7	17.45	23.42	5.44
27/09/2010	23h 55m 21.72s	-01° 21' 35.1"	20.09196	19.093860	158.80	174.5	3.7	5.7	17.41	23.38	5.40
28/09/2010	23h 55m 12.94s	-01° 22' 31.7"	20.09193	19.095861	158.82	173.5	3.7	5.7	17.37	23.34	5.35
29/09/2010	23h 55m 04.18s	-01° 23' 28.1"	20.09191	19.098162	158.83	172.5	3.7	5.7	17.33	23.30	5.31
30/09/2010	23h 54m 55.44s	-01° 24' 24.3"	20.09188	19.100764	158.86	171.5	3.7	5.7	17.29	23.26	5.27
01/10/2010	23h 54m 46.74s	-01° 25' 20.3"	20.09186	19.103665	158.88	170.5	3.7	5.7	17.25	23.22	5.23
02/10/2010	23h 54m 38.07s	-01° 26' 16.0"	20.09184	19.106867	158.91	169.5	3.7	5.7	17.21	23.18	5.19
03/10/2010	23h 54m 29.43s	-01° 27' 11.4"	20.09181	19.110367	158.94	168.4	3.7	5.7	17.17	23.14	5.15
04/10/2010	23h 54m 20.83s	-01° 28' 06.6"	20.09179	19.114166	158.97	167.4	3.7	5.7	17.13	23.10	5.11
05/10/2010	23h 54m 12.27s	-01° 29' 01.4"	20.09176	19.118262	159.00	166.4	3.7	5.7	17.09	23.06	5.06
06/10/2010	23h 54m 03.75s	-01° 29' 55.9"	20.09174	19.122656	159.04	165.4	3.7	5.7	17.05	23.02	5.02
07/10/2010	23h 53m 55.28s	-01° 30' 50.0"	20.09171	19.127346	159.08	164.4	3.7	5.7	17.01	22.58	4.58
08/10/2010	23h 53m 46.87s	-01° 31' 43.8"	20.09169	19.132331	159.12	163.3	3.7	5.7	16.57	22.53	4.54
09/10/2010	23h 53m 38.52s	-01° 32' 37.0"	20.09166	19.137609	159.16	162.3	3.7	5.7	16.53	22.49	4.50
10/10/2010	23h 53m 30.24s	-01° 33' 29.8"	20.09164	19.143179	159.21	161.3	3.7	5.7	16.49	22.45	4.46
11/10/2010	23h 53m 22.03s	-01° 34' 22.0"	20.09161	19.149037	159.26	160.3	3.7	5.7	16.45	22.41	4.42
12/10/2010	23h 53m 13.89s	-01° 35' 13.8"	20.09159	19.155184	159.31						



Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
03/11/2010	23h 50m 39.13s	-01° 51' 23.6"	20.09103	19.358067	161.00	136.6	3.6	5.8	15.13	21.08	3.08
04/11/2010	23h 50m 33.47s	-01° 51' 58.3"	20.09101	19.370109	161.10	135.6	3.6	5.8	15.09	21.04	3.04
05/11/2010	23h 50m 27.96s	-01° 52' 32.0"	20.09098	19.382372	161.20	134.6	3.6	5.8	15.05	21.00	2.59
06/11/2010	23h 50m 22.60s	-01° 53' 04.7"	20.09095	19.394850	161.30	133.6	3.6	5.8	15.01	20.56	2.55
07/11/2010	23h 50m 17.38s	-01° 53' 36.4"	20.09093	19.407539	161.41	132.5	3.6	5.8	14.57	20.52	2.51
08/11/2010	23h 50m 12.33s	-01° 54' 07.1"	20.09090	19.420436	161.51	131.5	3.6	5.8	14.53	20.48	2.47
09/11/2010	23h 50m 07.43s	-01° 54' 36.7"	20.09088	19.433535	161.62	130.5	3.6	5.8	14.49	20.44	2.43
10/11/2010	23h 50m 02.68s	-01° 55' 05.3"	20.09085	19.446831	161.73	129.5	3.6	5.8	14.45	20.40	2.39
11/11/2010	23h 49m 58.09s	-01° 55' 32.8"	20.09082	19.460322	161.85	128.4	3.6	5.8	14.41	20.36	2.35
12/11/2010	23h 49m 53.66s	-01° 55' 59.3"	20.09080	19.474000	161.96	127.4	3.6	5.8	14.37	20.32	2.31
13/11/2010	23h 49m 49.38s	-01° 56' 24.8"	20.09077	19.487863	162.08	126.4	3.6	5.8	14.33	20.28	2.27
14/11/2010	23h 49m 45.27s	-01° 56' 49.1"	20.09074	19.501906	162.19	125.4	3.6	5.8	14.29	20.24	2.23
15/11/2010	23h 49m 41.32s	-01° 57' 12.4"	20.09072	19.516123	162.31	124.3	3.6	5.8	14.25	20.20	2.19
16/11/2010	23h 49m 37.53s	-01° 57' 34.6"	20.09069	19.530510	162.43	123.3	3.6	5.8	14.21	20.16	2.15
17/11/2010	23h 49m 33.92s	-01° 57' 55.7"	20.09066	19.545063	162.55	122.3	3.6	5.8	14.17	20.12	2.11
18/11/2010	23h 49m 30.47s	-01° 58' 15.7"	20.09064	19.559777	162.67	121.3	3.6	5.8	14.13	20.08	2.07
19/11/2010	23h 49m 27.20s	-01° 58' 34.5"	20.09061	19.574647	162.80	120.2	3.6	5.8	14.09	20.04	2.03
20/11/2010	23h 49m 24.10s	-01° 58' 52.1"	20.09058	19.589669	162.92	119.2	3.6	5.8	14.05	20.00	1.59
21/11/2010	23h 49m 21.17s	-01° 59' 08.6"	20.09056	19.604837	163.05	118.2	3.6	5.8	14.01	19.56	1.55
22/11/2010	23h 49m 18.43s	-01° 59' 24.0"	20.09053	19.620149	163.18	117.2	3.6	5.8	13.57	19.52	1.51
23/11/2010	23h 49m 15.86s	-01° 59' 38.1"	20.09050	19.635598	163.30	116.2	3.6	5.8	13.53	19.48	1.47
24/11/2010	23h 49m 13.48s	-01° 59' 51.1"	20.09048	19.651181	163.43	115.1	3.6	5.8	13.49	19.44	1.43
25/11/2010	23h 49m 11.27s	-02° 00' 02.9"	20.09045	19.666892	163.56	114.1	3.6	5.8	13.45	19.40	1.39
26/11/2010	23h 49m 09.23s	-02° 00' 13.5"	20.09042	19.682728	163.70	113.1	3.6	5.8	13.41	19.36	1.35
27/11/2010	23h 49m 07.38s	-02° 00' 23.0"	20.09040	19.698684	163.83	112.1	3.6	5.8	13.37	19.32	1.31
28/11/2010	23h 49m 05.71s	-02° 00' 31.3"	20.09037	19.714754	163.96	111.1	3.6	5.8	13.34	19.28	1.27
29/11/2010	23h 49m 04.21s	-02° 00' 38.4"	20.09034	19.730935	164.10	110.0	3.6	5.8	13.30	19.24	1.23
30/11/2010	23h 49m 02.90s	-02° 00' 44.3"	20.09032	19.747221	164.23	109.0	3.6	5.8	13.26	19.20	1.19
01/12/2010	23h 49m 01.77s	-02° 00' 49.0"	20.09029	19.763608	164.37	108.0	3.5	5.8	13.22	19.17	1.15
02/12/2010	23h 49m 00.83s	-02° 00' 52.5"	20.09026	19.780089	164.51	107.0	3.5	5.8	13.18	19.13	1.11
03/12/2010	23h 49m 00.08s	-02° 00' 54.7"	20.09024	19.796661	164.64	106.0	3.5	5.8	13.14	19.09	1.07
04/12/2010	23h 48m 59.52s	-02° 00' 55.7"	20.09021	19.813317	164.78	105.0	3.5	5.8	13.10	19.05	1.03
05/12/2010	23h 48m 59.16s	-02° 00' 55.4"	20.09018	19.830052	164.92	103.9	3.5	5.8	13.06	19.01	1.00
06/12/2010	23h 48m 58.98s	-02° 00' 53.9"	20.09015	19.846860	165.06	102.9	3.5	5.8	13.02	18.57	0.56
07/12/2010	23h 48m 59.00s	-02° 00' 51.1"	20.09013	19.863736	165.20	101.9	3.5	5.8	12.58	18.53	0.52
08/12/2010	23h 48m 59.20s	-02° 00' 47.1"	20.09010	19.880673	165.34	100.9	3.5	5.8	12.54	18.49	0.48
09/12/2010	23h 48m 59.60s	-02° 00' 41.8"	20.09007	19.897668	165.48	99.9	3.5	5.8	12.50	18.45	0.44
10/12/2010	23h 49m 00.18s	-02° 00' 35.4"	20.09004	19.914713	165.63	98.9	3.5	5.8	12.46	18.41	0.40
11/12/2010	23h 49m 00.95s	-02° 00' 27.7"	20.09002	19.931803	165.77	97.9	3.5	5.8	12.42	18.37	0.36
12/12/2010	23h 49m 01.90s	-02° 00' 18.8"	20.08999	19.948933	165.91	96.8	3.5	5.8	12.38	18.33	0.32
13/12/2010	23h 49m 03.05s	-02° 00' 08.7"	20.08996	19.966098	166.05	95.8	3.5	5.8	12.34	18.29	0.28
14/12/2010	23h 49m 04.38s	-01° 59' 57.3"	20.08993	19.983291	166.20	94.8	3.5	5.8	12.31	18.25	0.24
15/12/2010	23h 49m 05.91s	-01° 59' 44.8"	20.08991	20.000509	166.34	93.8	3.5	5.8	12.27	18.22	0.20
16/12/2010	23h 49m 07.62s	-01° 59' 30.9"	20.08988	20.017745	166.48	92.8	3.5	5.8	12.23	18.18	0.17
17/12/2010	23h 49m 09.53s	-01° 59' 15.9"	20.08985	20.034994	166.63	91.8	3.5	5.8	12.19	18.14	0.13
18/12/2010	23h 49m 11.62s	-01° 58' 59.6"	20.08982	20.052251	166.77	90.8	3.5	5.8	12.15	18.10	0.09
19/12/2010	23h 49m 13.91s	-01° 58' 42.1"	20.08979	20.069511	166.91	89.8	3.5	5.8	12.11	18.06	0.05
20/12/2010	23h 49m 16.39s	-01° 58' 23.4"	20.08977	20.086769	167.06	88.8	3.5	5.8	12.07	18.02	23.57
21/12/2010	23h 49m 19.05s	-01° 58' 03.4"	20.08974	20.104020	167.20	87.8	3.5	5.8	12.03	17.58	23.53
22/12/2010	23h 49m 21.91s	-01° 57' 42.2"	20.08971	20.121260	167.34	86.8	3.5	5.8	11.59	17.54	23.49
23/12/2010	23h 49m 24.94s	-01° 57' 19.9"	20.08968	20.138483	167.49	85.8	3.5	5.8	11.55	17.50	23.46
24/12/2010	23h 49m 28.16s	-01° 56' 56.3"	20.08965	20.155685	167.63	84.8	3.5	5.8	11.51	17.47	23.42
25/12/2010	23h 49m 31.56s	-01° 56' 31.6"	20.08963	20.172861	167.77	83.8	3.5	5.8	11.48	17.43	23.38
26/12/2010	23h 49m 35.14s	-01° 56' 05.8"	20.08960	20.190005	167.92	82.8	3.5	5.8	11.44	17.39	23.34
27/12/2010	23h 49m 38.91s	-01° 55' 38.8"	20.08957	20.207114	168.06	81.7	3.5	5.8	11.40	17.35	23.30
28/12/2010	23h 49m 42.85s	-01° 55' 10.6"	20.08954	20.224182	168.20	80.7	3.5	5.8	11.36	17.31	23.26
29/12/2010	23h 49m 46.97s	-01° 54' 41.2"	20.08951	20.241204	168.34	79.7	3.5	5.8	11.32	17.27	23.23
30/12/2010	23h 49m 51.28s	-01° 54' 10.6"	20.08949	20.258175	168.48	78.7	3.5	5.8	11.28	17.23	23.19
31/12/2010	23h 49m 55.78s	-01° 53' 38.9"	20.08946	20.275089	168.62	77.8	3.5	5.8	11.24	17.20	23.15

A.R., Dec. = coordinate apparenti  
Distance = distanza dalla Terra in U.A.  
El. = elongazione dal Sole in °  
Mag. = magnitudine

R. = distanza dal Sole in U.A.  
Light = distanza in minuti-luce  
Diam. = diametro in "

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

A.R., Dec. = apparent coordinates  
Distance = distance from the Earth in A.U.  
El. = elongation from the Sun in °  
Mag. = magnitude

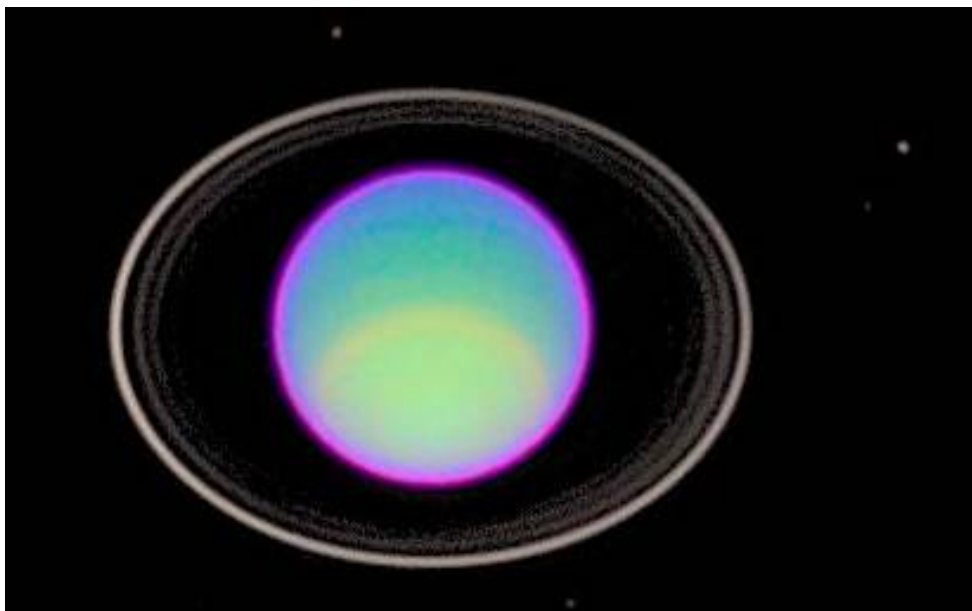
R. = distance from the Sun in A.U.  
Light = distance in minutes  
Diam. = diameter in "

Times of rising and setting of the planet for Rome (42°N, 12°E), in U.T.+1

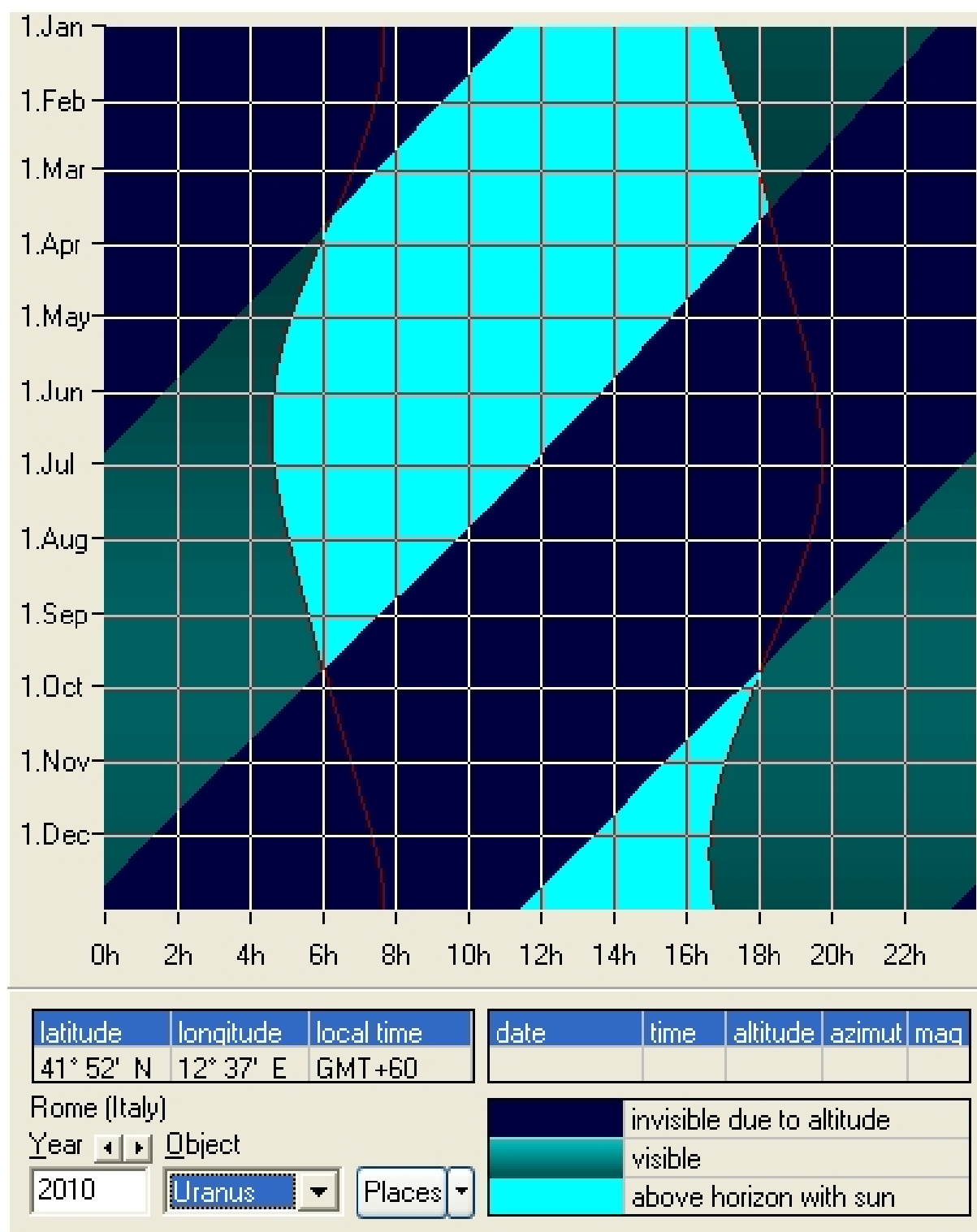
# FENOMENI DI URANO - PHENOMENA OF URANUS

Perielio - Perihelion	Questo anno non avviene - No phenomenon			
Afelio - Aphelion	Questo anno non avviene - No phenomenon			
Perigeo - Perigee	20/09/2010	20.19.59	19.08821 AU	
Apogeo - Apogee	18/03/2010	04.55.02	21.09091 AU	
Magnit. Max - Brightness maximum	20/09/2010	22.08.53	5.7	mag
Magnit. Min - Brightness minimum	18/03/2010	03.28.46	5.9	mag
Opposizione - Opposition	21/09/2010	16.58.07		
Congiunzione - Conjunction	17/03/2010	06.49.29		
Moto retrogr. - Retrograde motion	06/07/2010	00.31.04		
Moto diretto - Prograde motion	06/12/2010	10.02.31		
Max ang. Fase - Maximum phase angle	22/06/2010	08.34.59	2.9	°
Max ang. Fase - Maximum phase angle	18/12/2010	14.04.50	2.8	°
Min ang. Fase - Minimum phase angle	17/03/2010	07.04.13	0.0	°
Min ang. Fase - Minimum phase angle	21/09/2010	21.21.29	0.0	°

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# VISIBILITA' DI URANO - VISIBILITY OF URANUS



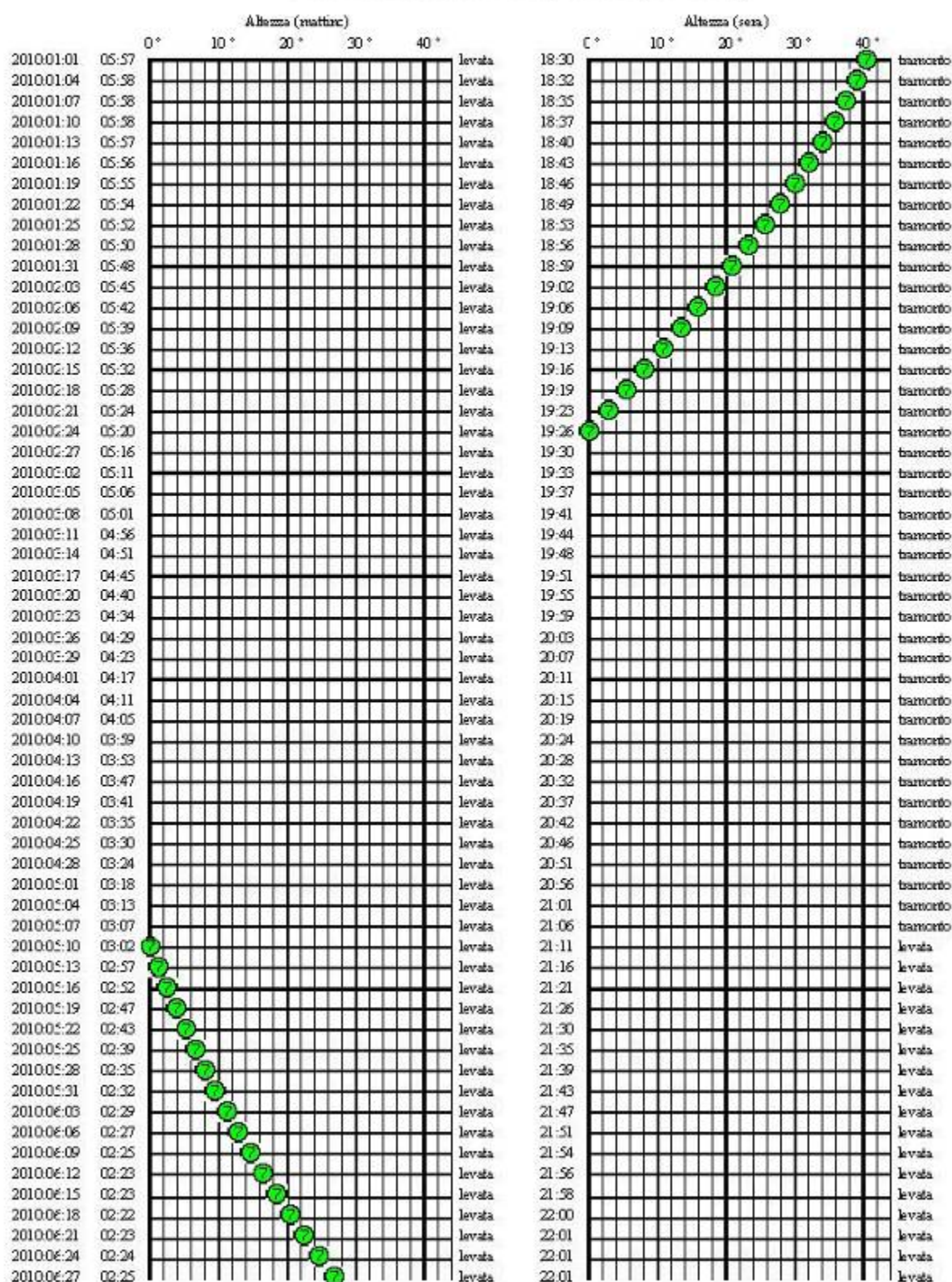
Visibilità di Urano nel corso dell'anno - Visibility of Uranus during the year

# Altezza ai crepuscoli

## di Urano

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



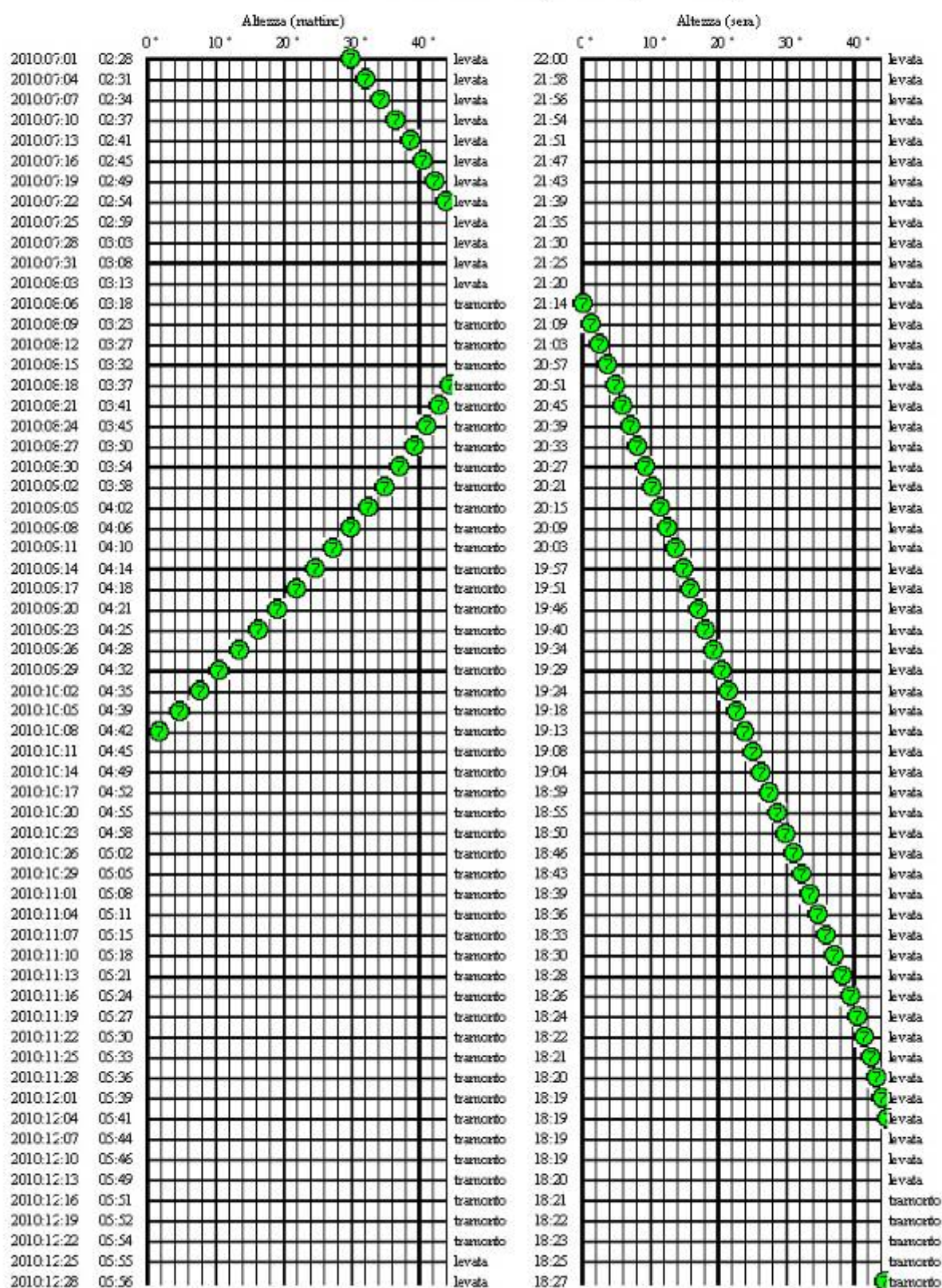


# Altezza ai crepuscoli

## di Urano

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:01:01	05:57	-49.7	21.3	72.4	18:30	40.4	209.7	71.9
2010:01:04	05:58	-48.7	25.6	69.5	18:32	39.1	213.9	68.9
2010:01:07	05:58	-47.7	29.7	66.5	18:35	37.6	217.9	66.0
2010:01:10	05:58	-46.6	33.5	63.5	18:37	35.9	221.8	63.0
2010:01:13	05:57	-45.3	37.0	60.6	18:40	34.1	225.6	60.0
2010:01:16	05:56	-44.1	40.3	57.6	18:43	32.2	229.2	57.1
2010:01:19	05:55	-42.8	43.3	54.7	18:46	30.1	232.7	54.2
2010:01:22	05:54	-41.4	46.2	51.7	18:49	28.0	236.0	51.2
2010:01:25	05:52	-40.0	48.8	48.8	18:53	25.7	239.2	48.3
2010:01:28	05:50	-38.7	51.2	45.9	18:56	23.4	242.3	45.4
2010:01:31	05:48	-37.3	53.5	43.0	18:59	21.0	245.3	42.5
2010:02:03	05:45	-35.9	55.6	40.1	19:02	18.5	248.2	39.5
2010:02:06	05:42	-34.6	57.6	37.2	19:06	16.0	250.9	36.6
2010:02:09	05:39	-33.2	59.4	34.3	19:09	13.4	253.7	33.8
2010:02:12	05:36	-31.9	61.2	31.4	19:13	10.8	256.3	30.9
2010:02:15	05:32	-30.6	62.8	28.5	19:16	8.2	258.9	28.0
2010:02:18	05:28	-29.3	64.3	25.7	19:19	5.5	261.5	25.1
2010:02:21	05:24	-28.1	65.8	22.8	19:23	2.9	264.0	22.3
2010:02:24	05:20	-26.8	67.2	20.0	19:26	0.2	266.5	19.4
2010:02:27	05:16	-25.6	68.5	17.1	19:30	-2.5	269.0	16.5
2010:03:02	05:11	-24.4	69.7	14.3	19:33	-5.2	271.5	13.7
2010:03:05	05:06	-23.3	70.9	11.4	19:37	-7.9	274.1	10.9
2010:03:08	05:01	-22.1	72.0	8.6	19:41	-10.6	276.6	8.0
2010:03:11	04:56	-21.0	73.1	5.8	19:44	-13.3	279.2	5.2
2010:03:14	04:51	-19.9	74.2	3.0	19:48	-16.0	281.9	2.5
2010:03:17	04:45	-18.8	75.2	0.7	19:51	-18.6	284.6	0.9
2010:03:20	04:40	-17.7	76.2	2.8	19:55	-21.2	287.4	3.4
2010:03:23	04:34	-16.7	77.1	5.5	19:59	-23.8	290.4	6.1
2010:03:26	04:29	-15.6	78.1	8.3	20:03	-26.4	293.4	8.9
2010:03:29	04:23	-14.6	79.0	11.1	20:07	-28.9	296.7	11.7
2010:04:01	04:17	-13.6	79.9	13.9	20:11	-31.3	300.0	14.5
2010:04:04	04:11	-12.6	80.7	16.7	20:15	-33.7	303.6	17.3
2010:04:07	04:05	-11.5	81.6	19.5	20:19	-36.0	307.4	20.1
2010:04:10	03:59	-10.5	82.5	22.2	20:24	-38.2	311.4	22.9
2010:04:13	03:53	-9.5	83.3	25.0	20:28	-40.3	315.7	25.7
2010:04:16	03:47	-8.5	84.2	27.8	20:32	-42.2	320.3	28.4
2010:04:19	03:41	-7.5	85.0	30.6	20:37	-43.9	325.2	31.2
2010:04:22	03:35	-6.4	85.9	33.3	20:42	-45.4	330.3	34.0
2010:04:25	03:30	-5.4	86.8	36.1	20:46	-46.7	335.8	36.8
2010:04:28	03:24	-4.3	87.6	38.9	20:51	-47.8	341.6	39.6
2010:05:01	03:18	-3.2	88.5	41.7	20:56	-48.5	347.5	42.3
2010:05:04	03:13	-2.1	89.5	44.4	21:01	-49.0	353.7	45.1
2010:05:07	03:07	-1.0	90.4	47.2	21:06	-49.1	359.9	47.9
2010:05:10	03:02	0.1	91.4	50.0	21:11	-48.9	6.1	50.7
2010:05:13	02:57	1.3	92.4	52.7	21:16	-48.3	12.3	53.4
2010:05:16	02:52	2.6	93.4	55.5	21:21	-47.5	18.2	56.2
2010:05:19	02:47	3.9	94.5	58.3	21:26	-46.4	23.9	59.0
2010:05:22	02:43	5.2	95.7	61.1	21:30	-45.0	29.4	61.8
2010:05:25	02:39	6.6	96.9	63.9	21:35	-43.4	34.5	64.6
2010:05:28	02:35	8.1	98.2	66.6	21:39	-41.5	39.3	67.4
2010:05:31	02:32	9.6	99.6	69.4	21:43	-39.6	43.8	70.2
2010:06:03	02:29	11.2	101.1	72.2	21:47	-37.5	47.9	73.0
2010:06:06	02:27	12.9	102.7	75.0	21:51	-35.4	51.7	75.8
2010:06:09	02:25	14.7	104.4	77.8	21:54	-33.2	55.2	78.6
2010:06:12	02:23	16.5	106.2	80.6	21:56	-30.9	58.5	81.4
2010:06:15	02:23	18.5	108.2	83.4	21:58	-28.7	61.5	84.2
2010:06:18	02:22	20.5	110.3	86.3	22:00	-26.5	64.3	87.0
2010:06:21	02:23	22.6	112.7	89.1	22:01	-24.4	66.8	89.9
2010:06:24	02:24	24.7	115.2	91.9	22:01	-22.3	69.2	92.7
2010:06:27	02:25	26.9	117.9	94.8	22:01	-20.2	71.4	95.5
2010:06:30	02:27	29.2	120.9	97.6	22:00	-18.3	73.4	98.4

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:07:01	02:28	29.9	121.9	98.5	22:00	-17.7	74.1	99.3
2010:07:04	02:31	32.2	125.2	101.4	21:58	-15.8	75.9	102.2
2010:07:07	02:34	34.4	128.8	104.3	21:56	-14.1	77.7	105.0
2010:07:10	02:37	36.6	132.7	107.1	21:54	-12.4	79.3	107.9
2010:07:13	02:41	38.6	136.9	110.0	21:51	-10.8	80.9	110.8
2010:07:16	02:45	40.6	141.5	112.9	21:47	-9.2	82.3	113.7
2010:07:19	02:49	42.3	146.4	115.8	21:43	-7.7	83.7	116.6
2010:07:22	02:54	43.9	151.6	118.7	21:39	-6.3	85.0	119.4
2010:07:25	02:59	45.2	157.1	121.6	21:35	-4.9	86.3	122.4
2010:07:28	03:03	46.3	162.9	124.5	21:30	-3.6	87.5	125.3
2010:07:31	03:08	47.0	169.0	127.4	21:25	-2.3	88.7	128.2
2010:08:03	03:13	47.4	175.1	130.4	21:20	-1.1	89.9	131.1
2010:08:06	03:18	47.5	181.4	133.3	21:14	0.2	91.0	134.1
2010:08:09	03:23	47.2	187.6	136.3	21:09	1.4	92.1	137.0
2010:08:12	03:27	46.6	193.7	139.2	21:03	2.5	93.2	140.0
2010:08:15	03:32	45.7	199.6	142.2	20:57	3.7	94.3	142.9
2010:08:18	03:37	44.4	205.3	145.2	20:51	4.8	95.4	145.9
2010:08:21	03:41	42.9	210.7	148.2	20:45	6.0	96.5	148.9
2010:08:24	03:45	41.2	215.8	151.2	20:39	7.1	97.6	151.9
2010:08:27	03:50	39.3	220.6	154.1	20:33	8.2	98.6	154.8
2010:08:30	03:54	37.1	225.1	157.2	20:27	9.3	99.7	157.8
2010:09:02	03:58	34.9	229.3	160.2	20:21	10.4	100.8	160.9
2010:09:05	04:02	32.4	233.2	163.2	20:15	11.5	101.9	163.9
2010:09:08	04:06	29.9	237.0	166.2	20:09	12.6	103.1	166.9
2010:09:11	04:10	27.3	240.5	169.2	20:03	13.7	104.2	169.9
2010:09:14	04:14	24.7	243.8	172.3	19:57	14.8	105.4	172.9
2010:09:17	04:18	21.9	247.0	175.3	19:51	15.9	106.6	175.9
2010:09:20	04:21	19.1	250.0	178.2	19:46	17.0	107.8	178.8
2010:09:23	04:25	16.3	252.9	178.3	19:40	18.2	109.0	177.8
2010:09:26	04:28	13.4	255.7	175.4	19:34	19.3	110.3	174.8
2010:09:29	04:32	10.5	258.5	172.4	19:29	20.4	111.7	171.7
2010:10:02	04:35	7.6	261.1	169.3	19:24	21.6	113.0	168.7
2010:10:05	04:39	4.7	263.7	166.3	19:18	22.7	114.4	165.6
2010:10:08	04:42	1.8	266.3	163.2	19:13	23.9	115.9	162.6
2010:10:11	04:45	-1.1	268.9	160.1	19:08	25.1	117.4	159.5
2010:10:14	04:49	-4.1	271.5	157.0	19:04	26.3	119.0	156.4
2010:10:17	04:52	-7.0	274.0	153.9	18:59	27.5	120.7	153.3
2010:10:20	04:55	-9.9	276.6	150.9	18:55	28.7	122.4	150.3
2010:10:23	04:58	-12.7	279.3	147.8	18:50	29.9	124.2	147.2
2010:10:26	05:02	-15.6	281.9	144.7	18:46	31.1	126.1	144.1
2010:10:29	05:05	-18.4	284.7	141.6	18:43	32.3	128.2	141.0
2010:11:01	05:08	-21.2	287.5	138.5	18:39	33.5	130.3	138.0
2010:11:04	05:11	-23.9	290.4	135.4	18:36	34.8	132.5	134.9
2010:11:07	05:15	-26.6	293.5	132.4	18:33	36.0	134.9	131.8
2010:11:10	05:18	-29.1	296.7	129.3	18:30	37.1	137.4	128.7
2010:11:13	05:21	-31.7	300.0	126.2	18:28	38.3	140.0	125.7
2010:11:16	05:24	-34.1	303.4	123.1	18:26	39.4	142.8	122.6
2010:11:19	05:27	-36.4	307.1	120.1	18:24	40.5	145.8	119.5
2010:11:22	05:30	-38.6	310.9	117.0	18:22	41.5	149.0	116.4
2010:11:25	05:33	-40.6	315.0	113.9	18:21	42.5	152.3	113.4
2010:11:28	05:36	-42.5	319.2	110.9	18:20	43.4	155.8	110.3
2010:12:01	05:39	-44.2	323.7	107.8	18:19	44.2	159.6	107.3
2010:12:04	05:41	-45.7	328.4	104.8	18:19	44.9	163.5	104.2
2010:12:07	05:44	-47.0	333.2	101.7	18:19	45.4	167.6	101.2
2010:12:10	05:46	-48.1	338.2	98.7	18:19	45.8	171.9	98.1
2010:12:13	05:49	-48.9	343.3	95.6	18:20	46.1	176.3	95.1
2010:12:16	05:51	-49.6	348.5	92.6	18:21	46.1	180.9	92.1
2010:12:19	05:52	-49.9	353.7	89.6	18:22	46.0	185.5	89.1
2010:12:22	05:54	-50.1	358.9	86.6	18:23	45.7	190.2	86.0
2010:12:25	05:55	-50.0	3.9	83.6	18:25	45.2	194.8	83.0
2010:12:28	05:56	-49.7	8.8	80.5	18:27	44.5	199.5	80.0
2010:12:31	05:57	-49.2	13.6	77.6	18:29	43.5	204.1	77.0

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza del pianeta sull'orizzonte, in °

Az = azimut del pianeta, in °

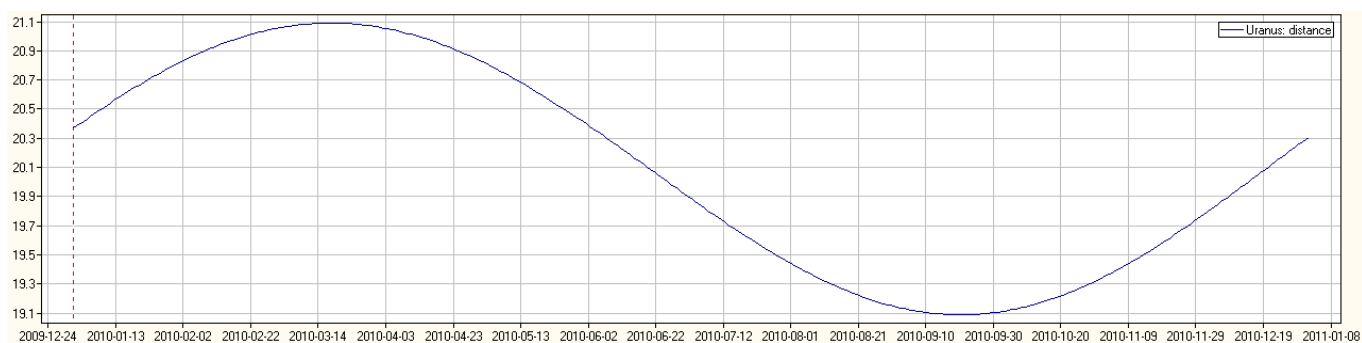
Elong = elongazione del pianeta, in °

Alt = altitude of the planet above the horizon, in °

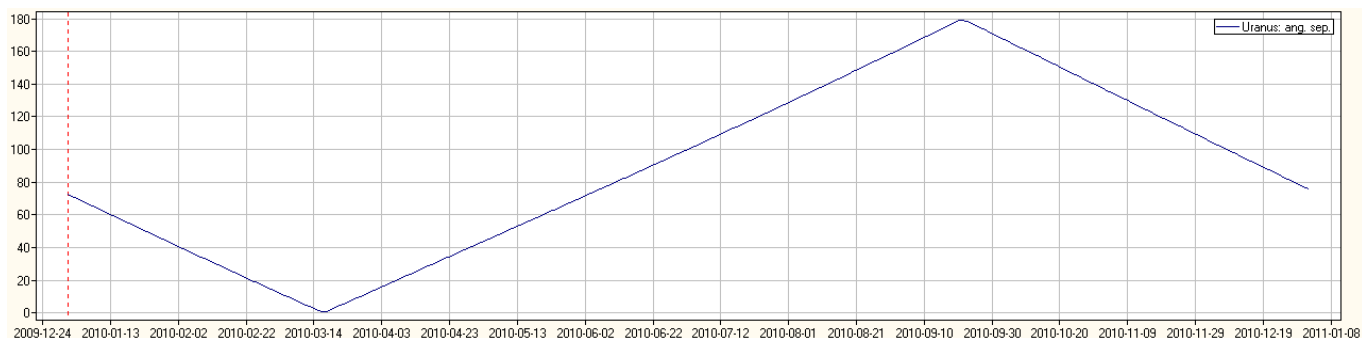
Az = azimuth of the planet, in °

Elong = elongation of the planet, in °

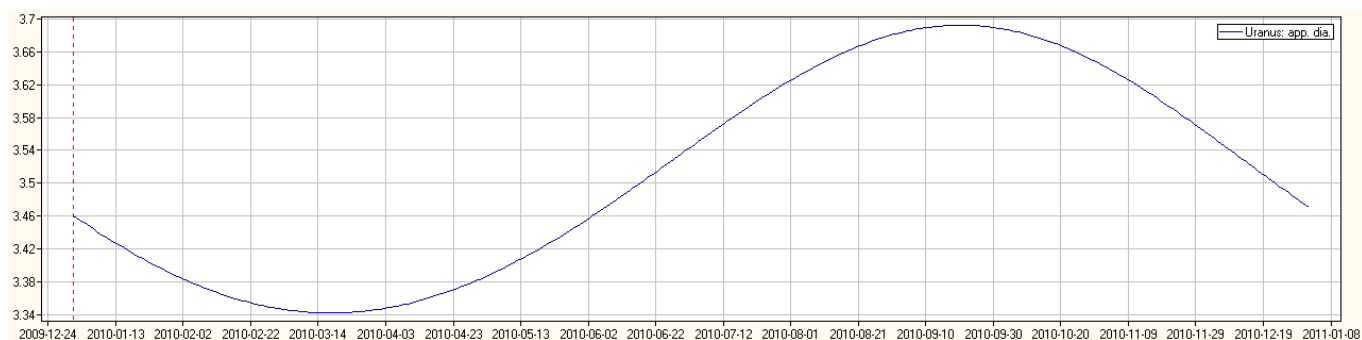




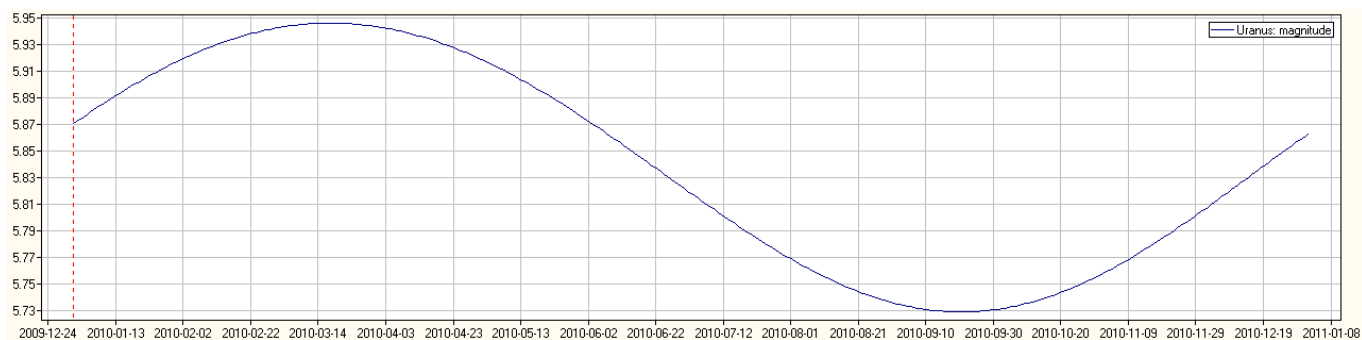
Distanza di Urano in U.A. nel corso dell'anno - Distance of Uranus in A.U. during the year



Elongazione di Urano in ° nel corso dell'anno - Elongation of Uranus in ° during the year



Diametro di Urano in " nel corso dell'anno - Diameter of Uranus in " during the year



Magnitudine di Urano nel corso dell'anno - Magnitude of Uranus during the year

# OCCULTAZIONI TRA I SATELLITI DI URANO

## OCCULTATIONS BETWEEN THE SATELLITES OF URANUS

Year	M	D	h	m	s	Event Type	Ph	Dur	dMag	%Ill	Sep	PA	MinD	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s	h	m	s			
2010	5	2	17	49	24	(I) ecl (V)	P	505	0.0	96.4	2.3	86	0.053	17	45	11	17	46	32				17	49	24				17	52	16	17	53	37
2010	10	8	3	50	44	(I) ecl (V)	P	1	2.1	15.0	7.2	330	0.024	3	50	44	3	50	44				3	50	44				3	50	45	3	50	45

Ore in T.U.

Legenda :

Data nel formato mese/giorno, un asterisco indica che le lune si avvicinano ma non si occultano  
 Event type : tipo di evento, eclissi o occultazione  
 Ph : fenomeno, M=mancato, E=eclisse penombrale, P=eclisse/occultazione parziale, T=eclisse/occultazione totale, A=eclisse/occultazione anulare  
 Durn : durata in secondi  
 dMag : caduta di luce in magnitudini  
 %ill : cambio in illuminazione, rispetto alla illuminazione intera, della luna rimanente (occultazione) o di entrambe (eclissi)  
 Sep : distanza in " tra satellite occultato/eclissato e centro del pianeta  
 Pa : angolo di posizione tra satellite occultato/eclissato e pianeta  
 MinSep : distanza minima tra i centri delle lune o tra la luna e l'ombra  
 T1-T7 : inizio/fine della fase di contatto con la penombra  
 T2-T6 : inizio/fine della fase di contatto con l'ombra o tra i lembi delle lune  
 T3-T5 : inizio/fine della fase di totalità  
 Tmax : tempo di metà evento

Satelliti :

I = Miranda  
 II = Ariel  
 III = Umbriel  
 IV = Titania  
 V = Oberon

Times in T.U.

Date in the format month/day, an asterisk shows that the moons are near but they don't occult  
 Event type : eclipse or occultation  
 Ph : phenomenon, M=missed, E=penumbral eclipse, P=partial eclipse/occultation, T=total eclipse/occultation, A=annular eclipse/occultation  
 Durn : duration in seconds  
 dMag : difference magnitude  
 %ill : defect of illumination, respect to integer  
 Sep : distance in " between the satellite and the center of the planet  
 Pa : position angle between the satellite and the center of the planet  
 MinD : least distance between the satellies  
 T1-T7 : penumbral phase begins/ends  
 T2-T6 : umbra phase begins/ends  
 T3-T5 : totalità phase begins/ends  
 Tmax : middle time of the event

Satellites :

I = Miranda  
 II = Ariel  
 III = Umbriel  
 IV = Titania  
 V = Oberon

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# EFFEMERIDI DI NETTUNO - EPHEMERIDES OF NEPTUNE

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
01/01/2010	21h 48m 04.99s	-13° 43' 19.5"	30.02451	30.722461	255.51	44.1	2.2	8.0	10.01	15.13	20.25
02/01/2010	21h 48m 11.86s	-13° 42' 44.1"	30.02449	30.734420	255.61	43.1	2.2	8.0	9.57	15.09	20.21
03/01/2010	21h 48m 18.81s	-13° 42' 08.4"	30.02446	30.746165	255.71	42.2	2.2	8.0	9.54	15.06	20.17
04/01/2010	21h 48m 25.84s	-13° 41' 32.2"	30.02443	30.757693	255.80	41.2	2.2	8.0	9.50	15.02	20.14
05/01/2010	21h 48m 32.95s	-13° 40' 55.6"	30.02440	30.769000	255.90	40.2	2.2	8.0	9.46	14.58	20.10
06/01/2010	21h 48m 40.13s	-13° 40' 18.5"	30.02438	30.780084	255.99	39.2	2.2	8.0	9.42	14.54	20.06
07/01/2010	21h 48m 47.40s	-13° 39' 41.1"	30.02435	30.790941	256.08	38.2	2.2	8.0	9.38	14.50	20.02
08/01/2010	21h 48m 54.74s	-13° 39' 03.2"	30.02432	30.801568	256.17	37.2	2.2	8.0	9.34	14.46	19.59
09/01/2010	21h 49m 02.16s	-13° 38' 24.9"	30.02429	30.811961	256.26	36.2	2.2	8.0	9.31	14.43	19.55
10/01/2010	21h 49m 09.66s	-13° 37' 46.2"	30.02426	30.822117	256.34	35.2	2.2	8.0	9.27	14.39	19.51
11/01/2010	21h 49m 17.23s	-13° 37' 07.1"	30.02424	30.832033	256.42	34.3	2.2	8.0	9.23	14.35	19.47
12/01/2010	21h 49m 24.88s	-13° 36' 27.6"	30.02421	30.841705	256.50	33.3	2.2	8.0	9.19	14.31	19.44
13/01/2010	21h 49m 32.59s	-13° 35' 47.8"	30.02418	30.851131	256.58	32.3	2.2	8.0	9.15	14.27	19.40
14/01/2010	21h 49m 40.37s	-13° 35' 07.7"	30.02415	30.860307	256.66	31.3	2.2	8.0	9.11	14.24	19.36
15/01/2010	21h 49m 48.22s	-13° 34' 27.2"	30.02413	30.869231	256.73	30.3	2.2	8.0	9.07	14.20	19.32
16/01/2010	21h 49m 56.12s	-13° 33' 46.4"	30.02410	30.877901	256.80	29.3	2.2	8.0	9.04	14.16	19.28
17/01/2010	21h 50m 04.08s	-13° 33' 05.3"	30.02407	30.886313	256.87	28.3	2.2	8.0	9.00	14.12	19.25
18/01/2010	21h 50m 12.10s	-13° 32' 23.9"	30.02404	30.894465	256.94	27.4	2.2	8.0	8.56	14.08	19.21
19/01/2010	21h 50m 20.17s	-13° 31' 42.2"	30.02402	30.902356	257.01	26.4	2.2	8.0	8.52	14.05	19.17
20/01/2010	21h 50m 28.30s	-13° 31' 00.3"	30.02399	30.909982	257.07	25.4	2.2	8.0	8.48	14.01	19.13
21/01/2010	21h 50m 36.47s	-13° 30' 18.0"	30.02396	30.917341	257.13	24.4	2.2	8.0	8.44	13.57	19.10
22/01/2010	21h 50m 44.70s	-13° 29' 35.5"	30.02393	30.924433	257.19	23.4	2.2	8.0	8.41	13.53	19.06
23/01/2010	21h 50m 52.97s	-13° 28' 52.7"	30.02390	30.931255	257.25	22.4	2.2	8.0	8.37	13.49	19.02
24/01/2010	21h 51m 01.30s	-13° 28' 09.6"	30.02388	30.937806	257.30	21.5	2.2	8.0	8.33	13.46	18.58
25/01/2010	21h 51m 09.67s	-13° 27' 26.3"	30.02385	30.944084	257.35	20.5	2.2	8.0	8.29	13.42	18.55
26/01/2010	21h 51m 18.09s	-13° 26' 42.8"	30.02382	30.950087	257.40	19.5	2.2	8.0	8.25	13.38	18.51
27/01/2010	21h 51m 26.54s	-13° 25' 59.0"	30.02379	30.955816	257.45	18.5	2.2	8.0	8.21	13.34	18.47
28/01/2010	21h 51m 35.04s	-13° 25' 15.0"	30.02377	30.961267	257.50	17.5	2.2	8.0	8.18	13.30	18.43
29/01/2010	21h 51m 43.58s	-13° 24' 30.9"	30.02374	30.966442	257.54	16.6	2.2	8.0	8.14	13.27	18.40
30/01/2010	21h 51m 52.14s	-13° 23' 46.6"	30.02371	30.971338	257.58	15.6	2.2	8.0	8.10	13.23	18.36
31/01/2010	21h 52m 00.73s	-13° 23' 02.1"	30.02368	30.975954	257.62	14.6	2.2	8.0	8.06	13.19	18.32
01/02/2010	21h 52m 09.35s	-13° 22' 17.5"	30.02365	30.980290	257.66	13.6	2.2	8.0	8.02	13.15	18.29
02/02/2010	21h 52m 17.99s	-13° 21' 32.8"	30.02363	30.984344	257.69	12.7	2.2	8.0	7.58	13.12	18.25
03/02/2010	21h 52m 26.66s	-13° 20' 47.8"	30.02360	30.988116	257.72	11.7	2.2	8.0	7.55	13.08	18.21
04/02/2010	21h 52m 35.36s	-13° 20' 02.8"	30.02357	30.991603	257.75	10.7	2.2	8.0	7.51	13.04	18.17
05/02/2010	21h 52m 44.08s	-13° 19' 17.5"	30.02354	30.994805	257.78	9.7	2.2	8.0	7.47	13.00	18.14
06/02/2010	21h 52m 52.82s	-13° 18' 32.2"	30.02352	30.997720	257.80	8.8	2.2	8.0	7.43	12.56	18.10
07/02/2010	21h 53m 01.58s	-13° 17' 46.7"	30.02349	31.000348	257.82	7.8	2.2	8.0	7.39	12.53	18.06
08/02/2010	21h 53m 10.37s	-13° 17' 01.1"	30.02346	31.002688	257.84	6.8	2.2	8.0	7.35	12.49	18.02
09/02/2010	21h 53m 19.17s	-13° 16' 15.5"	30.02343	31.004738	257.86	5.8	2.2	8.0	7.31	12.45	17.97
10/02/2010	21h 53m 27.98s	-13° 15' 29.8"	30.02340	31.006498	257.87	4.8	2.2	8.0	7.28	12.41	17.55
11/02/2010	21h 53m 36.80s	-13° 14' 44.0"	30.02338	31.007968	257.89	3.9	2.2	8.0	7.24	12.37	17.51
12/02/2010	21h 53m 45.63s	-13° 13' 58.2"	30.02335	31.009147	257.90	2.9	2.2	8.0	7.20	12.34	17.47
13/02/2010	21h 53m 54.47s	-13° 13' 12.4"	30.02332	31.010034	257.90	1.9	2.2	8.0	7.16	12.30	17.44
14/02/2010	21h 54m 03.31s	-13° 12' 26.6"	30.02329	31.010630	257.91	0.9	2.2	8.0	7.12	12.26	17.40
15/02/2010	21h 54m 12.13s	-13° 11' 41.8"	30.02326	31.010934	257.91	0.0	2.2	8.0	7.08	12.22	17.36
16/02/2010	21h 54m 20.92s	-13° 10' 55.2"	30.02324	31.010947	257.91	1.0	2.2	8.0	7.05	12.19	17.32
17/02/2010	21h 54m 29.75s	-13° 10' 09.2"	30.02321	31.010668	257.91	2.0	2.2	8.0	7.01	12.15	17.29
18/02/2010	21h 54m 38.58s	-13° 09' 23.3"	30.02318	31.010099	257.90	2.9	2.2	8.0	6.57	12.11	17.25
19/02/2010	21h 54m 47.39s	-13° 08' 37.4"	30.02315	31.009239	257.90	3.9	2.2	8.0	6.53	12.07	17.21
20/02/2010	21h 54m 56.20s	-13° 07' 51.6"	30.02312	31.008090	257.89	4.9	2.2	8.0	6.49	12.03	17.18
21/02/2010	21h 55m 05.00s	-13° 07' 05.8"	30.02310	31.006652	257.87	5.9	2.2	8.0	6.45	12.00	17.14
22/02/2010	21h 55m 13.79s	-13° 06' 20.1"	30.02307	31.004926	257.86	6.8	2.2	8.0	6.42	11.56	17.10
23/02/2010	21h 55m 22.57s	-13° 05' 34.4"	30.02304	31.002913	257.84	7.8	2.2	8.0	6.38	11.52	17.06
24/02/2010	21h 55m 31.33s	-13° 04' 48.9"	30.02301	31.000614	257.82	8.8	2.2	8.0	6.34	11.48	17.03
25/02/2010	21h 55m 40.08s	-13° 04' 03.4"	30.02298	30.998030	257.80	9.7	2.2	8.0	6.30	11.44	16.59
26/02/2010	21h 55m 48.80s	-13° 03' 18.1"	30.02296	30.995163	257.78	10.7	2.2	8.0	6.26	11.41	16.55
27/02/2010	21h 55m 57.49s	-13° 02' 32.9"	30.02293	30.992014	257.75	11.7	2.2	8.0	6.22	11.37	16.51
28/02/2010	21h 56m 06.16s	-13° 01' 47.8"	30.02290	30.988584	257.72	12.6	2.2	8.0	6.19	11.33	16.48
01/03/2010	21h 56m 14.79s	-13° 01' 02.9"	30.02287	30.984874	257.69	13.6	2.2	8.0	6.15	11.29	16.44
02/03/2010	21h 56m 23.40s	-13° 00' 18.1"	30.02284	30.980886	257.66	14.6	2.2	8.0	6.11	11.26	16.40
03/03/2010	21h 56m 31.97s	-12° 59' 33.5"	30.02282	30.976620	257.62	15.5	2.2	8.0	6.07	11.22	16.36
04/03/2010	21h 56m 40.52s	-12° 58' 49.0"	30.02279	30.972078	257.59	16.5	2.2	8.0	6.03	11.18	16.33
05/03/2010	21h 56m 49.03s	-12° 58' 04.6"	30.02276	30.967261	257.55	17.5	2.2	8.0	5.59	11.14	16.29
06/03/2010	21h 56m 57.51s	-12° 57' 20.5"	30.02273	30.962169	257.50	18.4	2.2	8.0	5.56	11.10	16.25
07/03/2010	21h 57m 05.96s	-12° 56' 36.5"	30.02270	30.956804	257.46	19.4	2.2	8.0	5.52	11.07	16.21
08/03/2010	21h 57m 14.37s	-12° 55' 52.7"	30.02267	30.951167	257.41	20.4	2.2	8.0	5.48	11.03	16.18
09/03/2010	21h 57m 22.74s	-12° 55' 09.1"	30.02265	30.945260	257.36	21.3	2.2	8.0	5.44	10.59	16.14
10/03/2010	21h 57m 31.06s	-12° 54' 25.8"	30.02262	30.939084	257.31	22.3	2.2	8.0	5.40	10.55	16.10
11/03/2010	21h 57m 39.34s	-12° 53' 42.7"	30.02259	30.932641	257.26	23.3	2.2	8.0	5.36	10.51	16.06
12/03/2010	21h 57m 47.57s	-12° 52' 59.9"	30.02256	30.925933	257.20	24.2	2.2	8.0	5.33	10.48	16.03
13/03/2010	21h 57m 55.75s	-12° 52' 17.3"	30.02253	30.918961	257.15	25.2	2.2	8.0	5.29	10.44	15.59
14/03/2010	21h 58m 03.87s	-12° 51' 35.0"	30.02251	30.911728	257.08	26.1	2.2	8.0	5.25	10.40	15.55
15/03/2010	21h 58m 11.94s	-12° 50' 53.0"	30.02248	30.904236	257.02	27.1	2.2	8.0	5.21	10.36	15.51
16/03/2010	21h 58m 19.95s	-12° 50' 11.3"	30.02245	30.896487	256.96	28.1	2.2	8.0	5.17	10.32	15.48
17/03/2010	21h 58m 27.91s	-12° 49' 29.9"	30.02242	30.888484	256.89	29.0	2.2	8.0	5.13	10.29	15.44
18/03/2010	21h 58m 35.80s	-12° 48' 48.8"	30.02239	30.880229	256.82	30.0	2.2	8.0	5.10	10.25	15.40
19/03/2010	21h 58m 43.64s	-12° 48' 08.0"	30.02236	30.871724	256.75	30.9	2.2	8.0	5.06	10.21	15.36
20/03/2010	21h 58m 51.42s	-12° 47' 27.4"	30.02234	30.862973	256.68	31.9	2.2	8.0	5.02	10.17	15.33
21/03/2010	21h 58m 59.14s	-12° 46' 47.2"	30.02231	30.853979	256.60	32.9	2.2	8.0	4.58	10.13	15.29
22/03/2010	21h 59m 06.80s	-12° 46' 07.4"	30.02228	30.844744	256.53	33.8	2.2	8.0	4.54	10.10	15.25
23/03/2010	21h 59m 14.39s	-12° 45' 27.9"	30.02225	30.835272	256.45	34.8	2.2	8.0	4.50	10.06	15.21
24/03/2010	21h 59m 21.92s	-12° 44' 48.8"	30.02222	30.825565							

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
09/04/2010	22h 01m 11.61s	-12° 35' 19.8"	30.02177	30.640921	254.83	51.1	2.2	7.9	3.45	9.01	14.17
10/04/2010	22h 01m 17.73s	-12° 34' 48.3"	30.02174	30.627705	254.72	52.0	2.2	7.9	3.41	8.57	14.13
11/04/2010	22h 01m 23.75s	-12° 34' 17.2"	30.02171	30.614311	254.61	53.0	2.2	7.9	3.37	8.53	14.09
12/04/2010	22h 01m 29.67s	-12° 33' 46.6"	30.02168	30.600745	254.50	53.9	2.2	7.9	3.33	8.49	14.06
13/04/2010	22h 01m 35.50s	-12° 33' 16.6"	30.02166	30.587010	254.38	54.9	2.2	7.9	3.29	8.46	14.02
14/04/2010	22h 01m 41.23s	-12° 32' 47.1"	30.02163	30.573109	254.27	55.9	2.2	7.9	3.25	8.42	13.58
15/04/2010	22h 01m 46.86s	-12° 32' 18.1"	30.02160	30.559048	254.15	56.8	2.2	7.9	3.22	8.38	13.54
16/04/2010	22h 01m 52.39s	-12° 31' 49.7"	30.02157	30.544830	254.03	57.8	2.2	7.9	3.18	8.34	13.50
17/04/2010	22h 01m 57.81s	-12° 31' 21.8"	30.02154	30.530459	253.91	58.7	2.2	7.9	3.14	8.30	13.47
18/04/2010	22h 02m 03.14s	-12° 30' 54.4"	30.02151	30.515941	253.79	59.7	2.2	7.9	3.10	8.26	13.43
19/04/2010	22h 02m 08.37s	-12° 30' 27.7"	30.02149	30.501279	253.67	60.6	2.2	7.9	3.06	8.22	13.39
20/04/2010	22h 02m 13.49s	-12° 30' 01.5"	30.02146	30.486478	253.55	61.6	2.2	7.9	3.02	8.19	13.35
21/04/2010	22h 02m 18.50s	-12° 29' 35.9"	30.02143	30.471542	253.42	62.5	2.2	7.9	2.58	8.15	13.31
22/04/2010	22h 02m 23.40s	-12° 29' 10.9"	30.02140	30.456477	253.30	63.5	2.2	7.9	2.54	8.11	13.27
23/04/2010	22h 02m 28.19s	-12° 28' 46.5"	30.02137	30.441287	253.17	64.4	2.2	7.9	2.51	8.07	13.24
24/04/2010	22h 02m 32.87s	-12° 28' 22.7"	30.02134	30.425975	253.05	65.4	2.2	7.9	2.47	8.03	13.20
25/04/2010	22h 02m 37.43s	-12° 27' 59.6"	30.02131	30.410546	252.92	66.4	2.2	7.9	2.43	7.59	13.16
26/04/2010	22h 02m 41.88s	-12° 27' 37.0"	30.02129	30.395006	252.79	67.3	2.2	7.9	2.39	7.56	13.12
27/04/2010	22h 02m 46.22s	-12° 27' 15.1"	30.02126	30.379356	252.66	68.3	2.2	7.9	2.35	7.52	13.08
28/04/2010	22h 02m 50.44s	-12° 26' 53.7"	30.02123	30.363603	252.53	69.2	2.2	7.9	2.31	7.48	13.04
29/04/2010	22h 02m 54.56s	-12° 26' 32.9"	30.02120	30.347749	252.39	70.2	2.2	7.9	2.27	7.44	13.01
30/04/2010	22h 02m 58.56s	-12° 26' 12.7"	30.02117	30.331799	252.26	71.1	2.2	7.9	2.23	7.40	12.57
01/05/2010	22h 03m 02.46s	-12° 25' 53.2"	30.02114	30.315758	252.13	72.1	2.2	7.9	2.19	7.36	12.53
02/05/2010	22h 03m 06.23s	-12° 25' 34.3"	30.02111	30.299628	251.99	73.0	2.2	7.9	2.16	7.32	12.49
03/05/2010	22h 03m 09.89s	-12° 25' 16.0"	30.02109	30.283414	251.86	74.0	2.2	7.9	2.12	7.28	12.45
04/05/2010	22h 03m 13.44s	-12° 24' 58.4"	30.02106	30.267121	251.72	74.9	2.2	7.9	2.08	7.25	12.41
05/05/2010	22h 03m 16.86s	-12° 24' 41.4"	30.02103	30.250753	251.59	75.9	2.2	7.9	2.04	7.21	12.38
06/05/2010	22h 03m 20.16s	-12° 24' 25.1"	30.02100	30.234314	251.45	76.9	2.2	7.9	2.00	7.17	12.34
07/05/2010	22h 03m 23.34s	-12° 24' 09.5"	30.02097	30.217810	251.31	77.8	2.2	7.9	1.56	7.13	12.30
08/05/2010	22h 03m 26.39s	-12° 23' 54.5"	30.02094	30.201243	251.18	78.8	2.2	7.9	1.52	7.09	12.26
09/05/2010	22h 03m 29.32s	-12° 23' 40.3"	30.02091	30.184620	251.04	79.7	2.2	7.9	1.48	7.05	12.22
10/05/2010	22h 03m 32.13s	-12° 23' 26.6"	30.02089	30.167944	250.90	80.7	2.2	7.9	1.44	7.01	12.18
11/05/2010	22h 03m 34.82s	-12° 23' 13.6"	30.02086	30.151221	250.76	81.6	2.2	7.9	1.41	6.57	12.14
12/05/2010	22h 03m 37.39s	-12° 23' 01.3"	30.02083	30.134455	250.62	82.6	2.2	7.9	1.37	6.54	12.10
13/05/2010	22h 03m 39.83s	-12° 22' 49.6"	30.02080	30.117652	250.48	83.5	2.2	7.9	1.33	6.50	12.07
14/05/2010	22h 03m 42.15s	-12° 22' 38.6"	30.02077	30.100816	250.34	84.5	2.2	7.9	1.29	6.46	12.03
15/05/2010	22h 03m 44.36s	-12° 22' 28.3"	30.02074	30.083953	250.20	85.5	2.2	7.9	1.25	6.42	11.59
16/05/2010	22h 03m 46.44s	-12° 22' 18.6"	30.02071	30.067068	250.06	86.4	2.2	7.9	1.21	6.38	11.55
17/05/2010	22h 03m 48.39s	-12° 22' 09.7"	30.02069	30.050165	249.92	87.4	2.2	7.9	1.17	6.34	11.51
18/05/2010	22h 03m 50.22s	-12° 22' 01.4"	30.02066	30.033250	249.78	88.3	2.2	7.9	1.13	6.30	11.47
19/05/2010	22h 03m 51.93s	-12° 21' 53.8"	30.02063	30.016329	249.64	89.3	2.2	7.9	1.09	6.26	11.43
20/05/2010	22h 03m 53.50s	-12° 21' 46.9"	30.02060	29.999405	249.50	90.2	2.2	7.9	1.05	6.22	11.39
21/05/2010	22h 03m 54.94s	-12° 21' 40.8"	30.02057	29.982484	249.36	91.2	2.2	7.9	1.01	6.18	11.35
22/05/2010	22h 03m 56.26s	-12° 21' 35.3"	30.02054	29.965571	249.22	92.1	2.2	7.9	0.58	6.15	11.32
23/05/2010	22h 03m 57.45s	-12° 21' 30.5"	30.02051	29.948671	249.08	93.1	2.2	7.9	0.54	6.11	11.28
24/05/2010	22h 03m 58.51s	-12° 21' 26.4"	30.02048	29.931787	248.93	94.1	2.2	7.9	0.50	6.07	11.24
25/05/2010	22h 03m 59.45s	-12° 21' 22.9"	30.02046	29.914925	248.79	95.0	2.2	7.9	0.46	6.03	11.20
26/05/2010	22h 04m 00.27s	-12° 21' 20.1"	30.02043	29.898089	248.65	96.0	2.2	7.9	0.42	5.59	11.16
27/05/2010	22h 04m 00.96s	-12° 21' 17.9"	30.02040	29.881283	248.51	96.9	2.2	7.9	0.38	5.55	11.12
28/05/2010	22h 04m 01.53s	-12° 21' 16.5"	30.02037	29.864512	248.38	97.9	2.2	7.9	0.34	5.51	11.08
29/05/2010	22h 04m 01.98s	-12° 21' 15.7"	30.02034	29.847780	248.24	98.8	2.2	7.9	0.30	5.47	11.04
30/05/2010	22h 04m 02.31s	-12° 21' 15.6"	30.02031	29.831091	248.10	99.8	2.3	7.9	0.26	5.43	11.00
31/05/2010	22h 04m 02.51s	-12° 21' 16.1"	30.02028	29.814450	247.96	100.8	2.3	7.9	0.22	5.39	10.56
01/06/2010	22h 04m 02.58s	-12° 21' 17.4"	30.02025	29.797862	247.82	101.7	2.3	7.9	0.18	5.35	10.52
02/06/2010	22h 04m 02.53s	-12° 21' 19.4"	30.02023	29.781330	247.68	102.7	2.3	7.9	0.14	5.31	10.48
03/06/2010	22h 04m 02.35s	-12° 21' 22.1"	30.02020	29.764860	247.55	103.6	2.3	7.9	0.10	5.27	10.44
04/06/2010	22h 04m 02.04s	-12° 21' 25.4"	30.02017	29.748455	247.41	104.6	2.3	7.9	0.07	5.23	10.40
05/06/2010	22h 04m 01.61s	-12° 21' 29.4"	30.02014	29.732122	247.27	105.6	2.3	7.9	0.03	5.20	10.37
06/06/2010	22h 04m 01.05s	-12° 21' 34.1"	30.02011	29.715863	247.14	106.5	2.3	7.9	23.55	5.16	10.33
07/06/2010	22h 04m 00.37s	-12° 21' 39.5"	30.02008	29.699685	247.00	107.5	2.3	7.9	23.51	5.12	10.29
08/06/2010	22h 03m 59.56s	-12° 21' 45.5"	30.02005	29.683592	246.87	108.4	2.3	7.9	23.47	5.08	10.25
09/06/2010	22h 03m 58.64s	-12° 21' 52.1"	30.02002	29.667589	246.74	109.4	2.3	7.9	23.43	5.04	10.21
10/06/2010	22h 03m 57.59s	-12° 21' 59.4"	30.02000	29.651680	246.61	110.4	2.3	7.9	23.39	5.00	10.17
11/06/2010	22h 03m 56.43s	-12° 22' 07.3"	30.01997	29.635870	246.47	111.3	2.3	7.9	23.35	4.56	10.13
12/06/2010	22h 03m 55.15s	-12° 22' 15.9"	30.01994	29.620165	246.34	112.3	2.3	7.9	23.31	4.52	10.09
13/06/2010	22h 03m 53.75s	-12° 22' 25.1"	30.01991	29.604569	246.21	113.2	2.3	7.9	23.27	4.48	10.05
14/06/2010	22h 03m 52.23s	-12° 22' 35.0"	30.01988	29.589088	246.08	114.2	2.3	7.9	23.23	4.44	10.01
15/06/2010	22h 03m 50.59s	-12° 22' 45.6"	30.01985	29.573725	245.96	115.2	2.3	7.9	23.19	4.40	9.57
16/06/2010	22h 03m 48.83s	-12° 22' 56.8"	30.01982	29.558487	245.83	116.1	2.3	7.9	23.15	4.36	9.53
17/06/2010	22h 03m 46.95s	-12° 23' 08.7"	30.01979	29.543376	245.70	117.1	2.3	7.9	23.11	4.32	9.49
18/06/2010	22h 03m 44.94s	-12° 23' 21.2"	30.01976	29.528399	245.58	118.1	2.3	7.9	23.07	4.28	9.45
19/06/2010	22h 03m 42.82s	-12° 23' 34.3"	30.01974	29.513558	245.46	119.0	2.3	7.9	23.03	4.24	9.41
20/06/2010	22h 03m 40.58s	-12° 23' 48.0"	30.01971	29.498858	245.33	120.0	2.3	7.9	22.59	4.20	9.37
21/06/2010	22h 03m 38.24s	-12° 24' 02.4"	30.01968	29.484304	245.21	121.0	2.3	7.9	22.55	4.16	9.33
22/06/2010	22h 03m 35.78s	-12° 24' 17.2"	30.01965	29.469899	245.09	121.9	2.3	7.9	22.52	4.12	9.29
23/06/2010	22h 03m 33.21s	-12° 24' 32.7"	30.01962	29.455647	244.98	122.9	2.3	7.9	22.48	4.08	9.25
24/06/2010	22h 03m 30.54s	-12° 24' 48.8"	30.01959	29.441551	244.86	123.9	2.3	7.9	22.44	4.04	9.21
25/06/2010	22h 03m 27.76s	-12° 25' 05.4"	30.01956	29.427616	244.74	124.8	2.3	7.9	22.40	4.00	9.17
26/06/2010	22h 03m 24.87s	-12° 25' 22.6"	30.01953	29.413845	244.63	125.8	2.3	7.8	22.36	3.56	9.13
27/06/2010	22h 03m 21.88s	-12° 25' 40.4"	30.01950	29.400242	244.51	126.7	2.3	7.8	22.32	3.52	9.09
28/06/2010	22h 03m 18.78s	-12° 25' 58.7"	30.01948	29.386810	244.40	127.7	2.3	7.8	22.28	3.48	9.05
29/06/2010	22h 03m 15.57s	-12° 26' 17.7"	30.01945	29.373554	244.29	128.7	2.3	7.8	22.24	3.44	9.01
30/06/2010	22h 03m 12.25s	-12° 26' 37.2"	30.01942	29.360477	244.18	129.7	2.3	7.8	22.20	3.40	8.57
01/0											

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
22/07/2010	22h 01m 35.81s	-12° 35' 49.1"	30.01878	29.125630	242.23	151.1	2.3	7.8	20.52	2.12	7.28
23/07/2010	22h 01m 30.52s	-12° 36' 18.8"	30.01875	29.117665	242.16	152.0	2.3	7.8	20.48	2.08	7.24
24/07/2010	22h 01m 25.16s	-12° 36' 48.9"	30.01872	29.109957	242.10	153.0	2.3	7.8	20.44	2.04	7.20
25/07/2010	22h 01m 19.74s	-12° 37' 19.3"	30.01869	29.102509	242.04	154.0	2.3	7.8	20.40	2.00	7.16
26/07/2010	22h 01m 14.26s	-12° 37' 50.0"	30.01866	29.095321	241.98	155.0	2.3	7.8	20.36	1.56	7.12
27/07/2010	22h 01m 08.72s	-12° 38' 21.1"	30.01863	29.088397	241.92	155.9	2.3	7.8	20.32	1.52	7.08
28/07/2010	22h 01m 03.12s	-12° 38' 52.4"	30.01860	29.081739	241.87	156.9	2.3	7.8	20.28	1.48	7.04
29/07/2010	22h 00m 57.46s	-12° 39' 24.0"	30.01857	29.075348	241.81	157.9	2.3	7.8	20.24	1.44	7.00
30/07/2010	22h 00m 51.74s	-12° 39' 55.9"	30.01854	29.069226	241.76	158.9	2.3	7.8	20.20	1.40	6.56
31/07/2010	22h 00m 45.98s	-12° 40' 28.0"	30.01851	29.063377	241.71	159.9	2.3	7.8	20.16	1.36	6.52
01/08/2010	22h 00m 40.17s	-12° 41' 00.4"	30.01849	29.057801	241.67	160.8	2.3	7.8	20.12	1.32	6.48
02/08/2010	22h 00m 34.31s	-12° 41' 32.9"	30.01846	29.052500	241.62	161.8	2.3	7.8	20.08	1.28	6.44
03/08/2010	22h 00m 28.41s	-12° 42' 05.7"	30.01843	29.047478	241.58	162.8	2.3	7.8	20.04	1.24	6.40
04/08/2010	22h 00m 22.47s	-12° 42' 38.6"	30.01840	29.042735	241.54	163.8	2.3	7.8	20.00	1.20	6.36
05/08/2010	22h 00m 16.49s	-12° 43' 11.7"	30.01837	29.038273	241.50	164.8	2.3	7.8	19.56	1.16	6.32
06/08/2010	22h 00m 10.47s	-12° 43' 45.0"	30.01834	29.034095	241.47	165.8	2.3	7.8	19.52	1.12	6.28
07/08/2010	22h 00m 04.43s	-12° 44' 18.4"	30.01831	29.030201	241.44	166.8	2.3	7.8	19.48	1.08	6.23
08/08/2010	21h 59m 58.35s	-12° 44' 52.0"	30.01828	29.026595	241.41	167.7	2.3	7.8	19.44	1.04	6.19
09/08/2010	21h 59m 52.23s	-12° 45' 25.8"	30.01825	29.023277	241.38	168.7	2.3	7.8	19.40	1.00	6.15
10/08/2010	21h 59m 46.09s	-12° 45' 59.7"	30.01822	29.020249	241.35	169.7	2.3	7.8	19.36	0.56	6.11
11/08/2010	21h 59m 39.91s	-12° 46' 33.8"	30.01819	29.017512	241.33	170.7	2.3	7.8	19.32	0.52	6.07
12/08/2010	21h 59m 33.71s	-12° 47' 07.9"	30.01816	29.015068	241.31	171.7	2.3	7.8	19.28	0.48	6.03
13/08/2010	21h 59m 27.48s	-12° 47' 42.2"	30.01813	29.012916	241.29	172.7	2.3	7.8	19.24	0.44	5.59
14/08/2010	21h 59m 21.24s	-12° 48' 16.4"	30.01810	29.011058	241.28	173.7	2.3	7.8	19.20	0.40	5.55
15/08/2010	21h 59m 14.98s	-12° 48' 50.8"	30.01807	29.009493	241.26	174.6	2.3	7.8	19.16	0.36	5.51
16/08/2010	21h 59m 08.71s	-12° 49' 25.1"	30.01805	29.008223	241.25	175.6	2.3	7.8	19.12	0.32	5.47
17/08/2010	21h 59m 02.43s	-12° 49' 59.5"	30.01802	29.007248	241.25	176.6	2.3	7.8	19.08	0.28	5.43
18/08/2010	21h 58m 56.15s	-12° 50' 33.8"	30.01799	29.006566	241.24	177.6	2.3	7.8	19.04	0.24	5.39
19/08/2010	21h 58m 49.86s	-12° 51' 08.2"	30.01796	29.006179	241.24	178.5	2.3	7.8	19.00	0.19	5.35
20/08/2010	21h 58m 43.57s	-12° 51' 42.5"	30.01793	29.006087	241.24	179.3	2.3	7.8	18.56	0.15	5.30
21/08/2010	21h 58m 37.27s	-12° 52' 16.9"	30.01790	29.006288	241.24	179.1	2.3	7.8	18.52	0.11	5.26
22/08/2010	21h 58m 30.97s	-12° 52' 51.3"	30.01787	29.006784	241.24	178.3	2.3	7.8	18.48	0.07	5.22
23/08/2010	21h 58m 24.68s	-12° 53' 25.6"	30.01784	29.007574	241.25	177.4	2.3	7.8	18.44	0.03	5.18
24/08/2010	21h 58m 18.38s	-12° 53' 59.9"	30.01781	29.008658	241.26	176.4	2.3	7.8	18.40	23.55	5.14
25/08/2010	21h 58m 12.10s	-12° 54' 34.1"	30.01778	29.010036	241.27	175.4	2.3	7.8	18.36	23.51	5.10
26/08/2010	21h 58m 05.82s	-12° 55' 08.2"	30.01775	29.011706	241.28	174.4	2.3	7.8	18.32	23.47	5.06
27/08/2010	21h 57m 59.55s	-12° 55' 42.2"	30.01772	29.013670	241.30	173.4	2.3	7.8	18.28	23.43	5.02
28/08/2010	21h 57m 53.29s	-12° 56' 16.1"	30.01769	29.015927	241.32	172.5	2.3	7.8	18.24	23.39	4.58
29/08/2010	21h 57m 47.05s	-12° 56' 49.9"	30.01766	29.018477	241.34	171.5	2.3	7.8	18.20	23.35	4.54
30/08/2010	21h 57m 40.84s	-12° 57' 23.6"	30.01763	29.021318	241.36	170.5	2.3	7.8	18.16	23.31	4.50
31/08/2010	21h 57m 34.65s	-12° 57' 57.0"	30.01760	29.024451	241.39	169.5	2.3	7.8	18.12	23.27	4.46
01/09/2010	21h 57m 28.48s	-12° 58' 30.4"	30.01757	29.027876	241.42	168.5	2.3	7.8	18.08	23.23	4.42
02/09/2010	21h 57m 22.34s	-12° 59' 03.5"	30.01754	29.031591	241.45	167.5	2.3	7.8	18.04	23.19	4.38
03/09/2010	21h 57m 16.24s	-12° 59' 36.4"	30.01751	29.035596	241.48	166.5	2.3	7.8	18.00	23.15	4.33
04/09/2010	21h 57m 10.16s	-13° 00' 09.2"	30.01749	29.039890	241.52	165.5	2.3	7.8	17.56	23.11	4.29
05/09/2010	21h 57m 04.12s	-13° 00' 41.8"	30.01746	29.044473	241.56	164.5	2.3	7.8	17.52	23.07	4.25
06/09/2010	21h 56m 58.11s	-13° 01' 14.2"	30.01743	29.049344	241.60	163.5	2.3	7.8	17.48	23.03	4.21
07/09/2010	21h 56m 52.13s	-13° 01' 46.3"	30.01740	29.054501	241.64	162.5	2.3	7.8	17.44	22.59	4.17
08/09/2010	21h 56m 46.20s	-13° 02' 18.3"	30.01737	29.059944	241.68	161.5	2.3	7.8	17.40	22.55	4.13
09/09/2010	21h 56m 40.30s	-13° 02' 50.0"	30.01734	29.065670	241.73	160.5	2.3	7.8	17.36	22.51	4.09
10/09/2010	21h 56m 34.44s	-13° 03' 21.3"	30.01731	29.071679	241.78	159.5	2.3	7.8	17.32	22.47	4.05
11/09/2010	21h 56m 28.64s	-13° 03' 52.4"	30.01728	29.077967	241.83	158.5	2.3	7.8	17.28	22.43	4.01
12/09/2010	21h 56m 22.89s	-13° 04' 23.2"	30.01725	29.084533	241.89	157.5	2.3	7.8	17.24	22.39	3.57
13/09/2010	21h 56m 17.20s	-13° 04' 53.6"	30.01722	29.091375	241.95	156.5	2.3	7.8	17.20	22.35	3.53
14/09/2010	21h 56m 11.56s	-13° 05' 23.7"	30.01719	29.098489	242.00	155.6	2.3	7.8	17.16	22.31	3.49
15/09/2010	21h 56m 05.99s	-13° 05' 53.5"	30.01716	29.105875	242.07	154.6	2.3	7.8	17.12	22.27	3.45
16/09/2010	21h 56m 00.47s	-13° 06' 22.9"	30.01713	29.113529	242.13	153.6	2.3	7.8	17.08	22.23	3.41
17/09/2010	21h 55m 55.02s	-13° 06' 52.0"	30.01710	29.121448	242.20	152.6	2.3	7.8	17.04	22.19	3.37
18/09/2010	21h 55m 49.63s	-13° 07' 20.8"	30.01707	29.129631	242.26	151.6	2.3	7.8	17.00	22.15	3.33
19/09/2010	21h 55m 44.30s	-13° 07' 49.2"	30.01704	29.138075	242.33	150.6	2.3	7.8	16.57	22.11	3.29
20/09/2010	21h 55m 39.04s	-13° 08' 17.2"	30.01701	29.146776	242.41	149.6	2.3	7.8	16.53	22.06	3.24
21/09/2010	21h 55m 33.84s	-13° 08' 44.8"	30.01698	29.155734	242.48	148.6	2.3	7.8	16.49	22.02	3.20
22/09/2010	21h 55m 28.71s	-13° 09' 12.1"	30.01695	29.164944	242.56	147.6	2.3	7.8	16.45	21.58	3.16
23/09/2010	21h 55m 23.66s	-13° 09' 38.9"	30.01692	29.174405	242.64	146.6	2.3	7.8	16.41	21.54	3.12
24/09/2010	21h 55m 18.68s	-13° 10' 05.3"	30.01689	29.184113	242.72	145.6	2.3	7.8	16.37	21.50	3.08
25/09/2010	21h 55m 13.78s	-13° 10' 31.2"	30.01686	29.194067	242.80	144.6	2.3	7.8	16.33	21.46	3.04
26/09/2010	21h 55m 08.97s	-13° 10' 56.7"	30.01683	29.204262	242.88	143.6	2.3	7.8	16.29	21.42	3.00
27/09/2010	21h 55m 04.23s	-13° 11' 21.7"	30.01680	29.214698	242.97	142.6	2.3	7.8	16.25	21.38	2.56
28/09/2010	21h 54m 59.58s	-13° 11' 46.3"	30.01677	29.225370	243.06	141.6	2.3	7.8	16.21	21.34	2.52
29/09/2010	21h 54m 55.02s	-13° 12' 10.3"	30.01674	29.236276	243.15	140.6	2.3	7.8	16.17	21.30	2.48
30/09/2010	21h 54m 50.55s	-13° 12' 33.9"	30.01671	29.247413	243.24	139.6	2.3	7.8	16.13	21.26	2.44
01/10/2010	21h 54m 46.17s	-13° 12' 57.0"	30.01668	29.258778	243.34	138.6	2.3	7.8	16.09	21.22	2.40
02/10/2010	21h 54m 41.88s	-13° 13' 19.6"	30.01665	29.270368	243.43	137.6	2.3	7.8	16.05	21.18	2.36
03/10/2010	21h 54m 37.68s	-13° 13' 41.7"	30.01662	29.282181	243.53	136.6	2.3	7.8	16.01	21.14	2.32
04/10/2010	21h 54m 33.57s	-13° 14' 03.4"	30.01659	29.294212	243.63	135.6	2.3	7.8	15.57	21.10	2.28
05/10/2010	21h 54m 29.56s	-13° 14' 24.5"	30.01656	29.306458	243.73	134.5	2.3	7.8	15.53	21.06	2.24
06/10/2010	21h 54m 25.63s	-13° 14' 45.0"	30.01653	29.318915	243.84	133.5	2.3	7.8	15.49	21.02	2.20
07/10/2010	21h 54m 21.81s	-13° 15' 05.1"	30.01650	29.331581	243.94	132.5	2.3	7.8	15.45	20.58	2.16
08/10/2010	21h 54m 18.09s	-13° 15' 24.5"	30.01647	29.344450	244.05	131.5	2.3	7.8	15.41	20.54	2.12
09/10/2010	21h 54m 14.47s	-13° 15' 43.4"	30.01644	29.357519	244.16	130.5	2.3	7.8	15.37	20.50	2.08
10/10/2010	21h 54m 10.97s	-13° 16' 01.7"	30.01641	29.370783	244.27	129.5	2.3	7.8	15.33	20.46	2.04
11/10/2010	21h 54m 07.57s	-13° 16' 19.4"	30.01638	29.384238	244.38	128.5	2.3	7.8	15.29	20.42	2.00
12/10/2010	21h 54m 04.29s	-13° 16' 36.4"	30.01635</								

Date	A.R. Geoc.	Dec. Geoc.	R A.U.	Distance A.U.	Light (m)	El. °	Diam. "	Mag.	Rise	Transit	Set
03/11/2010	21h 53m 21.57s	-13° 20' 14.8"	30.01569	29.736078	247.31	105.5	2.3	7.9	13.58	19.11	0.28
04/11/2010	21h 53m 21.05s	-13° 20' 17.1"	30.01566	29.752768	247.45	104.5	2.3	7.9	13.54	19.07	0.25
05/11/2010	21h 53m 20.67s	-13° 20' 18.7"	30.01563	29.769534	247.59	103.4	2.3	7.9	13.50	19.03	0.21
06/11/2010	21h 53m 20.42s	-13° 20' 19.6"	30.01560	29.786370	247.73	102.4	2.3	7.9	13.46	18.59	0.17
07/11/2010	21h 53m 20.31s	-13° 20' 19.7"	30.01557	29.803272	247.87	101.4	2.3	7.9	13.42	18.56	0.13
08/11/2010	21h 53m 20.33s	-13° 20' 19.2"	30.01554	29.820233	248.01	100.4	2.3	7.9	13.38	18.52	0.09
09/11/2010	21h 53m 20.49s	-13° 20' 17.9"	30.01551	29.837247	248.15	99.4	2.3	7.9	13.34	18.48	0.05
10/11/2010	21h 53m 20.78s	-13° 20' 16.0"	30.01548	29.854311	248.29	98.4	2.2	7.9	13.30	18.44	23.57
11/11/2010	21h 53m 21.21s	-13° 20' 13.4"	30.01545	29.871417	248.43	97.4	2.2	7.9	13.27	18.40	23.53
12/11/2010	21h 53m 21.76s	-13° 20' 10.1"	30.01542	29.888560	248.58	96.4	2.2	7.9	13.23	18.36	23.49
13/11/2010	21h 53m 22.45s	-13° 20' 06.1"	30.01539	29.905736	248.72	95.4	2.2	7.9	13.19	18.32	23.45
14/11/2010	21h 53m 23.26s	-13° 20' 01.5"	30.01536	29.922938	248.86	94.4	2.2	7.9	13.15	18.28	23.41
15/11/2010	21h 53m 24.21s	-13° 19' 56.1"	30.01533	29.940162	249.00	93.4	2.2	7.9	13.11	18.24	23.37
16/11/2010	21h 53m 25.28s	-13° 19' 50.1"	30.01530	29.957402	249.15	92.4	2.2	7.9	13.07	18.20	23.33
17/11/2010	21h 53m 26.49s	-13° 19' 43.3"	30.01527	29.974654	249.29	91.4	2.2	7.9	13.03	18.16	23.30
18/11/2010	21h 53m 27.83s	-13° 19' 35.9"	30.01524	29.991912	249.44	90.4	2.2	7.9	12.59	18.12	23.26
19/11/2010	21h 53m 29.31s	-13° 19' 27.7"	30.01521	30.009171	249.58	89.4	2.2	7.9	12.55	18.09	23.22
20/11/2010	21h 53m 30.92s	-13° 19' 18.8"	30.01518	30.026426	249.72	88.4	2.2	7.9	12.51	18.05	23.18
21/11/2010	21h 53m 32.66s	-13° 19' 09.2"	30.01515	30.043672	249.87	87.4	2.2	7.9	12.47	18.01	23.15
22/11/2010	21h 53m 34.54s	-13° 18' 58.9"	30.01512	30.060905	250.01	86.4	2.2	7.9	12.43	17.57	23.10
23/11/2010	21h 53m 36.55s	-13° 18' 48.0"	30.01509	30.078119	250.15	85.4	2.2	7.9	12.40	17.53	23.06
24/11/2010	21h 53m 38.69s	-13° 18' 36.3"	30.01506	30.095310	250.30	84.4	2.2	7.9	12.36	17.49	23.02
25/11/2010	21h 53m 40.97s	-13° 18' 23.9"	30.01503	30.112472	250.44	83.4	2.2	7.9	12.32	17.45	22.59
26/11/2010	21h 53m 43.37s	-13° 18' 10.9"	30.01500	30.129602	250.58	82.4	2.2	7.9	12.28	17.41	22.55
27/11/2010	21h 53m 45.90s	-13° 17' 57.3"	30.01497	30.146693	250.72	81.4	2.2	7.9	12.24	17.37	22.51
28/11/2010	21h 53m 48.56s	-13° 17' 43.0"	30.01494	30.163742	250.86	80.4	2.2	7.9	12.20	17.33	22.47
29/11/2010	21h 53m 51.34s	-13° 17' 28.0"	30.01491	30.180743	251.01	79.4	2.2	7.9	12.16	17.30	22.43
30/11/2010	21h 53m 54.24s	-13° 17' 12.3"	30.01488	30.197690	251.15	78.4	2.2	7.9	12.12	17.26	22.39
01/12/2010	21h 53m 57.28s	-13° 16' 56.0"	30.01485	30.214579	251.29	77.4	2.2	7.9	12.08	17.22	22.35
02/12/2010	21h 54m 00.44s	-13° 16' 38.9"	30.01482	30.231405	251.43	76.4	2.2	7.9	12.04	17.18	22.31
03/12/2010	21h 54m 03.74s	-13° 16' 21.2"	30.01479	30.248161	251.57	75.4	2.2	7.9	12.01	17.14	22.28
04/12/2010	21h 54m 07.16s	-13° 16' 02.8"	30.01476	30.264843	251.71	74.4	2.2	7.9	11.57	17.10	22.24
05/12/2010	21h 54m 10.72s	-13° 15' 43.6"	30.01473	30.281445	251.84	73.4	2.2	7.9	11.53	17.06	22.20
06/12/2010	21h 54m 14.40s	-13° 15' 23.9"	30.01470	30.297961	251.98	72.4	2.2	7.9	11.49	17.02	22.16
07/12/2010	21h 54m 18.20s	-13° 15' 03.5"	30.01466	30.314387	252.12	71.4	2.2	7.9	11.45	16.59	22.12
08/12/2010	21h 54m 22.13s	-13° 14' 42.5"	30.01463	30.330717	252.25	70.4	2.2	7.9	11.41	16.55	22.08
09/12/2010	21h 54m 26.18s	-13° 14' 20.8"	30.01460	30.346946	252.39	69.4	2.2	7.9	11.37	16.51	22.05
10/12/2010	21h 54m 30.36s	-13° 13' 58.5"	30.01457	30.363069	252.52	68.4	2.2	7.9	11.33	16.47	22.01
11/12/2010	21h 54m 34.63s	-13° 13' 35.7"	30.01454	30.379081	252.66	67.4	2.2	7.9	11.29	16.43	21.57
12/12/2010	21h 54m 39.03s	-13° 13' 12.2"	30.01451	30.394977	252.79	66.4	2.2	7.9	11.26	16.39	21.53
13/12/2010	21h 54m 43.55s	-13° 12' 48.0"	30.01448	30.410752	252.92	65.4	2.2	7.9	11.22	16.35	21.49
14/12/2010	21h 54m 48.18s	-13° 12' 23.3"	30.01445	30.426403	253.05	64.4	2.2	7.9	11.18	16.32	21.45
15/12/2010	21h 54m 52.93s	-13° 11' 58.0"	30.01442	30.441924	253.18	63.4	2.2	7.9	11.14	16.28	21.42
16/12/2010	21h 54m 57.79s	-13° 11' 32.0"	30.01439	30.457311	253.31	62.4	2.2	7.9	11.10	16.24	21.38
17/12/2010	21h 55m 02.76s	-13° 11' 05.5"	30.01436	30.472559	253.43	61.4	2.2	7.9	11.06	16.20	21.34
18/12/2010	21h 55m 07.85s	-13° 10' 38.3"	30.01433	30.487665	253.56	60.4	2.2	7.9	11.02	16.16	21.30
19/12/2010	21h 55m 13.06s	-13° 10' 10.5"	30.01430	30.502623	253.68	59.4	2.2	7.9	10.58	16.12	21.26
20/12/2010	21h 55m 18.37s	-13° 09' 42.2"	30.01427	30.517431	253.81	58.4	2.2	7.9	10.55	16.08	21.22
21/12/2010	21h 55m 23.80s	-13° 09' 13.3"	30.01424	30.532084	253.93	57.5	2.2	7.9	10.51	16.05	21.19
22/12/2010	21h 55m 29.33s	-13° 08' 43.8"	30.01421	30.546579	254.05	56.5	2.2	7.9	10.47	16.01	21.15
23/12/2010	21h 55m 34.97s	-13° 08' 13.8"	30.01418	30.560910	254.17	55.5	2.2	7.9	10.43	15.57	21.11
24/12/2010	21h 55m 40.71s	-13° 07' 43.3"	30.01415	30.575075	254.29	54.5	2.2	7.9	10.39	15.53	21.07
25/12/2010	21h 55m 46.54s	-13° 07' 12.2"	30.01412	30.589069	254.40	53.5	2.2	7.9	10.35	15.49	21.03
26/12/2010	21h 55m 52.48s	-13° 06' 40.6"	30.01409	30.602889	254.52	52.5	2.2	7.9	10.31	15.45	21.00
27/12/2010	21h 55m 58.51s	-13° 06' 08.6"	30.01406	30.616530	254.63	51.5	2.2	7.9	10.27	15.42	20.56
28/12/2010	21h 56m 04.64s	-13° 05' 35.9"	30.01403	30.629988	254.74	50.5	2.2	7.9	10.24	15.38	20.52
29/12/2010	21h 56m 10.86s	-13° 05' 02.8"	30.01400	30.643260	254.85	49.5	2.2	7.9	10.20	15.34	20.48
30/12/2010	21h 56m 17.19s	-13° 04' 29.1"	30.01397	30.656340	254.96	48.5	2.2	7.9	10.16	15.30	20.44
31/12/2010	21h 56m 23.61s	-13° 03' 54.8"	30.01393	30.669225	255.07	47.5	2.2	8.0	10.12	15.26	20.41

A.R., Dec. = coordinate apparenti  
Distance = distanza dalla Terra in U.A.  
El. = elongazione dal Sole in °  
Mag. = magnitudine

R. = distanza dal Sole in U.A.  
Light = distanza in minuti-luce  
Diam. = diametro in "

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

A.R., Dec. = apparent coordinates  
Distance = distance from the Earth in A.U.  
El. = elongation from the Sun in °  
Mag. = magnitude

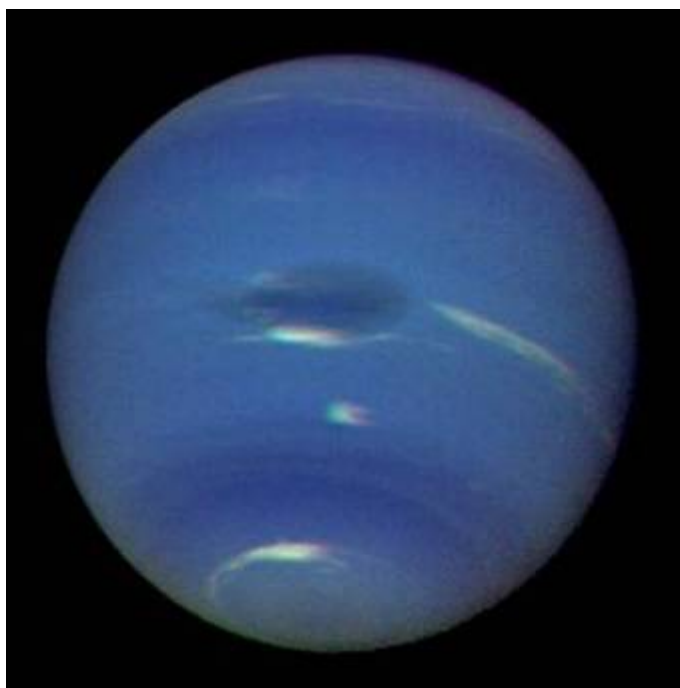
R. = distance from the Sun in A.U.  
Light = distance in minutes  
Diam. = diameter in "

Times of rising and setting of the planet for Rome (42°N, 12°E), in U.T.+1

# FENOMENI DI NETTUNO - PHENOMENA OF NEPTUNE

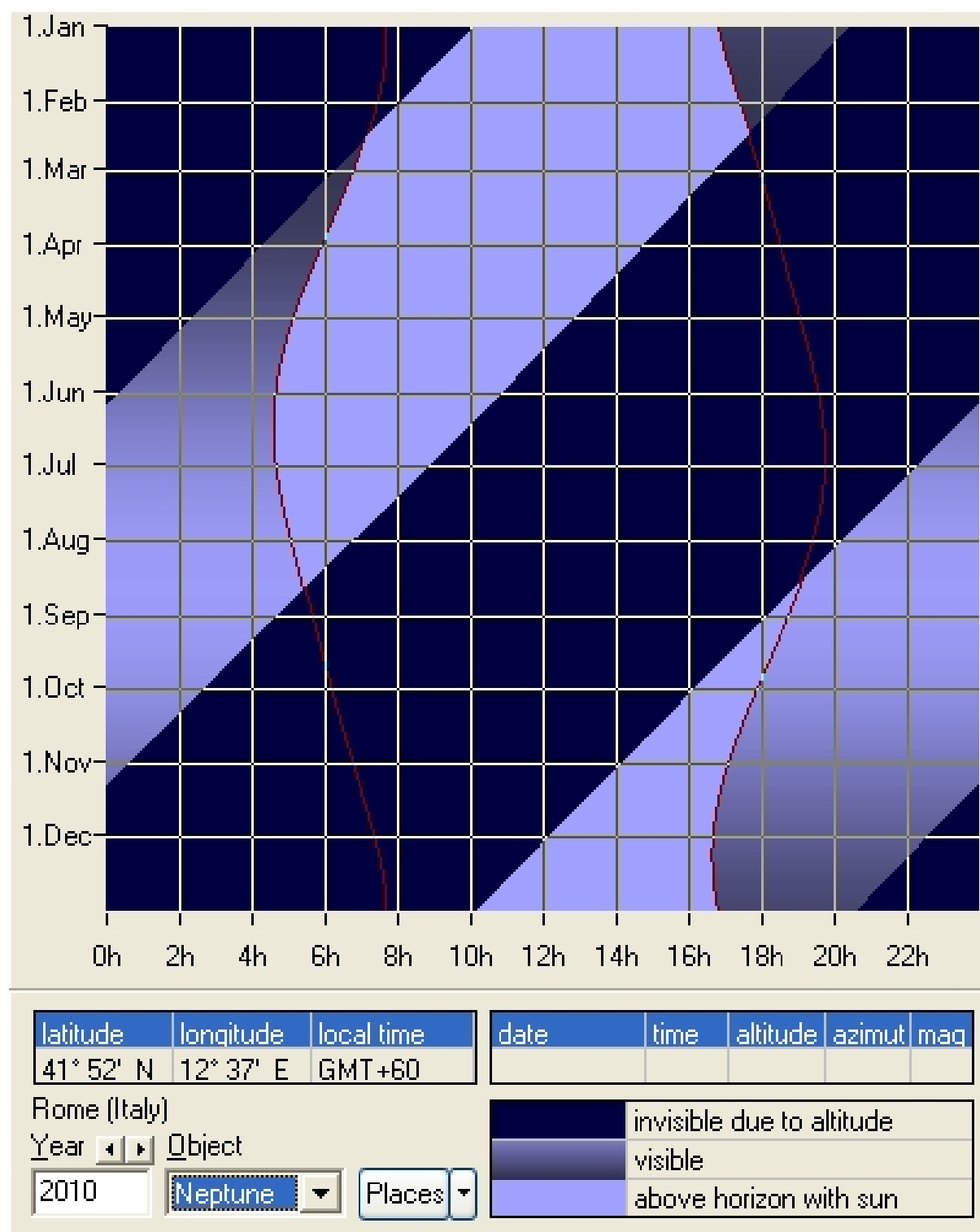
Perielio - Perihelion	Questo anno non avviene - No phenomenon			
Afelio - Aphelion	Questo anno non avviene - No phenomenon			
Perigeo - Perigee	19/08/2010	19.33.35	29.00599 AU	
Apogeo - Apogee	15/02/2010	13.03.52	31.01089 AU	
Magnit. Max - Brightness maximum	19/08/2010	21.52.43	7.8	mag
Magnit. Min - Brightness minimum	15/02/2010	10.41.07	8.0	mag
Opposizione - Opposition	20/08/2010	10.07.05		
Congiunzione - Conjunction	14/02/2010	23.19.15		
Moto retrogr. - Retrograde motion	01/06/2010	01.51.33		
Moto diretto - Prograde motion	07/11/2010	07.41.50		
Max ang. Fase - Maximum phase angle	20/05/2010	14.28.10	1.9	°
Max ang. Fase - Maximum phase angle	17/11/2010	21.38.32	1.9	°
Min ang. Fase - Minimum phase angle	15/02/2010	00.44.28	0.0	°
Min ang. Fase - Minimum phase angle	20/08/2010	15.39.32	0.0	°

© (5)





# VISIBILITA' DI NETTUNO - VISIBILITY OF NEPTUNE



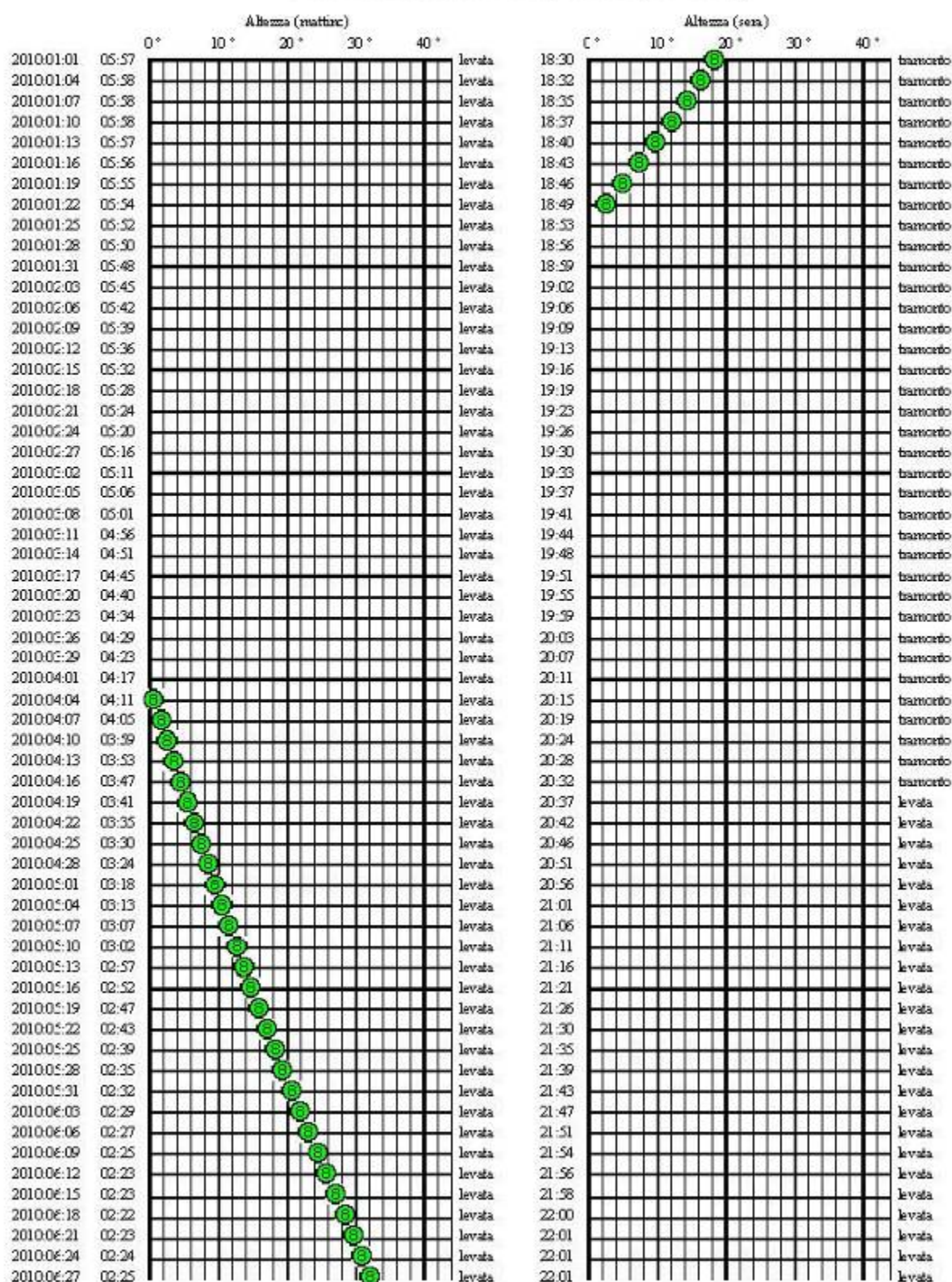
Visibilità di Nettuno nel corso dell'anno - Visibility of Neptune during the year

# Altezza ai crepuscoli

di Nettuno

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



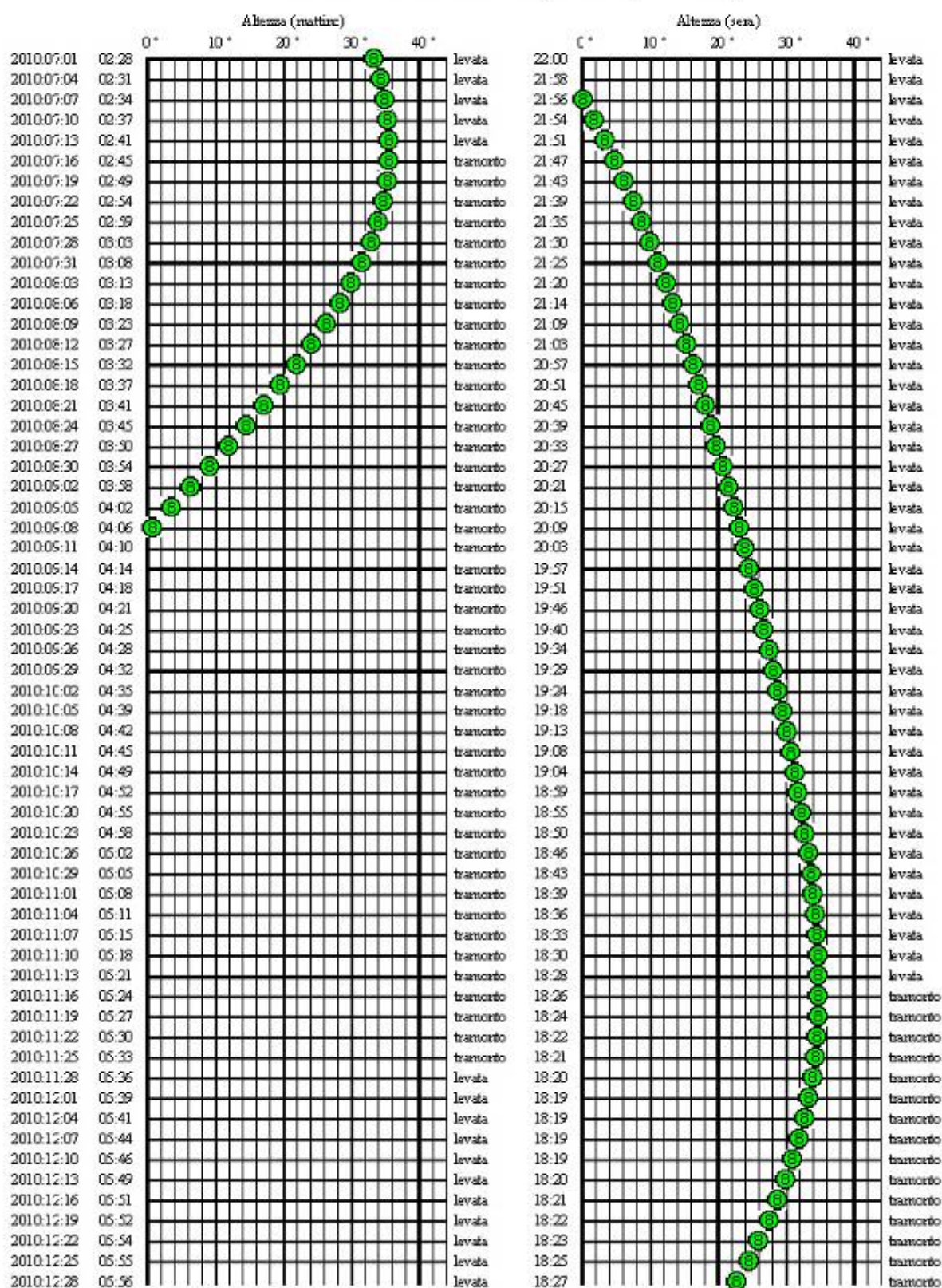


# Altezza ai crepuscoli

di Nettuno

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:01:01	05:57	-45.1	63.4	43.9	18:30	18.4	230.7	43.4
2010:01:04	05:58	-43.0	66.3	41.0	18:32	16.3	233.6	40.4
2010:01:07	05:58	-41.0	68.9	38.0	18:35	14.2	236.3	37.5
2010:01:10	05:58	-39.0	71.4	35.0	18:37	12.0	239.0	34.5
2010:01:13	05:57	-37.1	73.6	32.1	18:40	9.7	241.7	31.6
2010:01:16	05:56	-35.1	75.8	29.1	18:43	7.4	244.3	28.6
2010:01:19	05:55	-33.2	77.7	26.2	18:46	5.0	246.9	25.6
2010:01:22	05:54	-31.4	79.6	23.2	18:49	2.5	249.4	22.7
2010:01:25	05:52	-29.6	81.4	20.3	18:53	-0.1	251.9	19.8
2010:01:28	05:50	-27.8	83.0	17.3	18:56	-2.7	254.3	16.8
2010:01:31	05:48	-26.1	84.6	14.4	18:59	-5.3	256.8	13.9
2010:02:03	05:45	-24.5	86.1	11.5	19:02	-8.0	259.2	10.9
2010:02:06	05:42	-22.9	87.6	8.6	19:06	-10.6	261.6	8.0
2010:02:09	05:39	-21.3	88.9	5.6	19:09	-13.3	264.0	5.1
2010:02:12	05:36	-19.8	90.2	2.7	19:13	-16.1	266.5	2.2
2010:02:15	05:32	-18.3	91.5	0.5	19:16	-18.8	269.0	0.9
2010:02:18	05:28	-16.9	92.7	3.1	19:19	-21.5	271.5	3.7
2010:02:21	05:24	-15.5	93.9	6.0	19:23	-24.3	274.0	6.6
2010:02:24	05:20	-14.2	95.0	8.9	19:26	-27.0	276.7	9.5
2010:02:27	05:16	-12.9	96.1	11.8	19:30	-29.7	279.4	12.4
2010:03:02	05:11	-11.6	97.1	14.7	19:33	-32.4	282.2	15.3
2010:03:05	05:06	-10.4	98.2	17.6	19:37	-35.1	285.2	18.2
2010:03:08	05:01	-9.2	99.2	20.5	19:41	-37.8	288.3	21.1
2010:03:11	04:56	-8.0	100.2	23.4	19:44	-40.4	291.7	24.0
2010:03:14	04:51	-6.8	101.2	26.3	19:48	-42.9	295.2	26.9
2010:03:17	04:45	-5.7	102.1	29.2	19:51	-45.4	299.0	29.8
2010:03:20	04:40	-4.6	103.0	32.1	19:55	-47.8	303.1	32.7
2010:03:23	04:34	-3.5	104.0	34.9	19:59	-50.1	307.6	35.5
2010:03:26	04:29	-2.5	104.9	37.8	20:03	-52.2	312.4	38.4
2010:03:29	04:23	-1.4	105.8	40.7	20:07	-54.2	317.8	41.3
2010:04:01	04:17	-0.4	106.7	43.5	20:11	-56.0	323.6	44.2
2010:04:04	04:11	0.6	107.6	46.4	20:15	-57.6	330.0	47.1
2010:04:07	04:05	1.6	108.6	49.3	20:19	-58.9	336.8	49.9
2010:04:10	03:59	2.6	109.5	52.1	20:24	-59.9	344.2	52.8
2010:04:13	03:53	3.6	110.4	55.0	20:28	-60.4	351.9	55.7
2010:04:16	03:47	4.6	111.3	57.9	20:32	-60.6	359.9	58.5
2010:04:19	03:41	5.6	112.3	60.7	20:37	-60.4	7.9	61.4
2010:04:22	03:35	6.5	113.3	63.6	20:42	-59.8	15.7	64.3
2010:04:25	03:30	7.5	114.3	66.5	20:46	-58.7	23.3	67.1
2010:04:28	03:24	8.5	115.3	69.3	20:51	-57.3	30.4	70.0
2010:05:01	03:18	9.5	116.4	72.2	20:56	-55.6	37.0	72.9
2010:05:04	03:13	10.6	117.4	75.0	21:01	-53.6	43.1	75.7
2010:05:07	03:07	11.6	118.6	77.9	21:06	-51.4	48.7	78.6
2010:05:10	03:02	12.6	119.8	80.8	21:11	-48.9	53.8	81.5
2010:05:13	02:57	13.7	121.0	83.6	21:16	-46.4	58.5	84.3
2010:05:16	02:52	14.8	122.3	86.5	21:21	-43.6	62.8	87.2
2010:05:19	02:47	15.9	123.7	89.3	21:26	-40.8	66.7	90.1
2010:05:22	02:43	17.0	125.1	92.2	21:30	-38.0	70.4	93.0
2010:05:25	02:39	18.2	126.7	95.1	21:35	-35.1	73.8	95.8
2010:05:28	02:35	19.4	128.3	97.9	21:39	-32.2	77.0	98.7
2010:05:31	02:32	20.6	130.1	100.8	21:43	-29.3	80.0	101.6
2010:06:03	02:29	21.9	132.1	103.7	21:47	-26.4	82.9	104.5
2010:06:06	02:27	23.2	134.1	106.6	21:51	-23.6	85.6	107.3
2010:06:09	02:25	24.5	136.4	109.5	21:54	-20.8	88.1	110.2
2010:06:12	02:23	25.8	138.8	112.3	21:56	-18.1	90.6	113.1
2010:06:15	02:23	27.1	141.5	115.2	21:58	-15.5	92.9	116.0
2010:06:18	02:22	28.4	144.4	118.1	22:00	-13.0	95.1	118.9
2010:06:21	02:23	29.7	147.5	121.0	22:01	-10.6	97.2	121.8
2010:06:24	02:24	30.9	150.8	123.9	22:01	-8.4	99.2	124.7
2010:06:27	02:25	32.0	154.4	126.8	22:01	-6.2	101.1	127.6
2010:06:30	02:27	33.1	158.3	129.7	22:00	-4.2	103.0	130.5

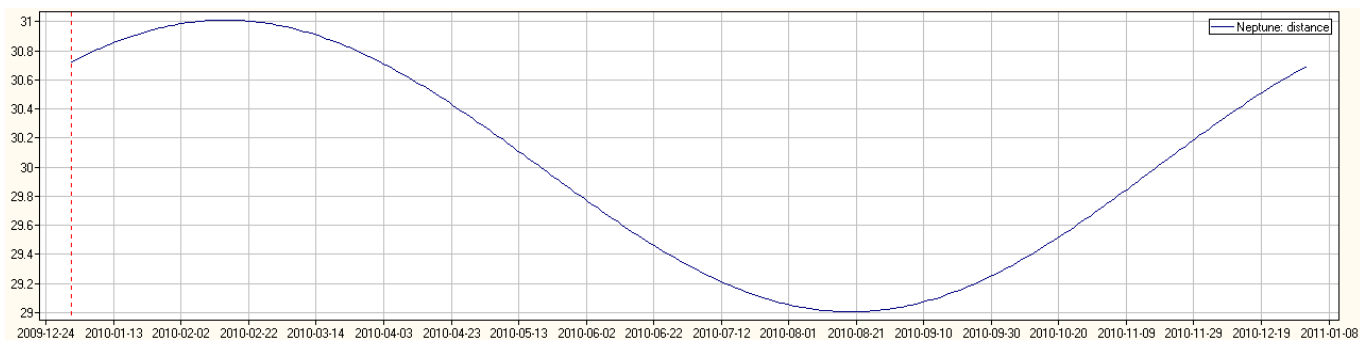
Morning twilights = crepuscolo mattutino  
Evening twilight = crepuscolo serale

Date = data nel formato aaaa/mm/gg  
Times = ore

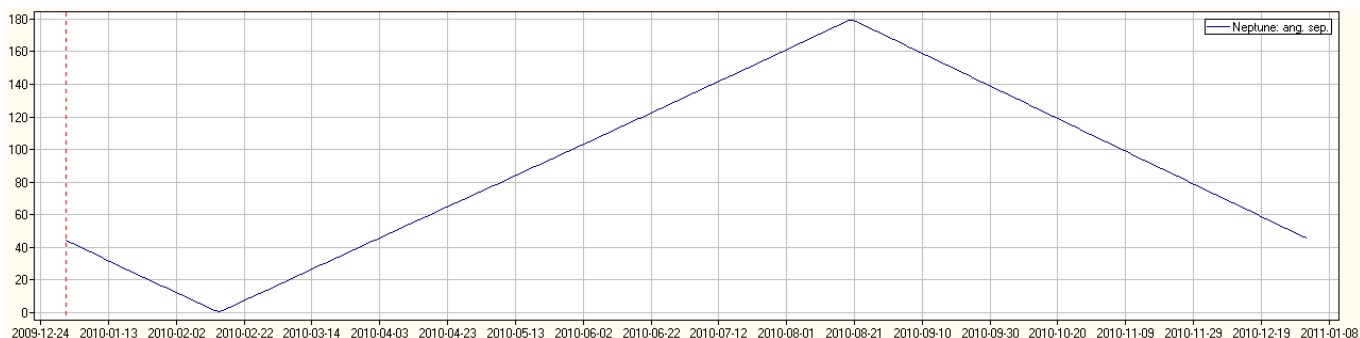
Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:07:01	02:28	33.4	159.7	130.7	22:00	-3.6	103.6	131.5
2010:07:04	02:31	34.2	163.9	133.6	21:58	-1.7	105.3	134.4
2010:07:07	02:34	34.9	168.3	136.5	21:56	0.1	107.0	137.3
2010:07:10	02:37	35.3	172.9	139.4	21:54	1.7	108.6	140.2
2010:07:13	02:41	35.6	177.6	142.3	21:51	3.3	110.1	143.1
2010:07:16	02:45	35.5	182.5	145.3	21:47	4.8	111.6	146.0
2010:07:19	02:49	35.2	187.4	148.2	21:43	6.2	113.0	149.0
2010:07:22	02:54	34.7	192.3	151.1	21:39	7.5	114.5	151.9
2010:07:25	02:59	33.9	197.1	154.1	21:35	8.8	115.8	154.8
2010:07:28	03:03	32.8	201.9	157.0	21:30	10.0	117.2	157.8
2010:07:31	03:08	31.5	206.5	160.0	21:25	11.1	118.5	160.7
2010:08:03	03:13	30.0	210.9	162.9	21:20	12.2	119.8	163.6
2010:08:06	03:18	28.2	215.2	165.9	21:14	13.3	121.1	166.6
2010:08:09	03:23	26.3	219.3	168.8	21:09	14.3	122.3	169.5
2010:08:12	03:27	24.2	223.3	171.8	21:03	15.3	123.6	172.5
2010:08:15	03:32	21.9	227.0	174.7	20:57	16.2	124.9	175.4
2010:08:18	03:37	19.6	230.5	177.7	20:51	17.2	126.1	178.4
2010:08:21	03:41	17.1	233.9	179.2	20:45	18.1	127.4	178.5
2010:08:24	03:45	14.5	237.2	176.3	20:39	18.9	128.7	175.6
2010:08:27	03:50	11.9	240.3	173.3	20:33	19.8	130.0	172.7
2010:08:30	03:54	9.2	243.3	170.4	20:27	20.6	131.3	169.7
2010:09:02	03:58	6.4	246.2	167.4	20:21	21.5	132.6	166.7
2010:09:05	04:02	3.6	248.9	164.4	20:15	22.3	133.9	163.7
2010:09:08	04:06	0.7	251.6	161.4	20:09	23.0	135.3	160.7
2010:09:11	04:10	-2.1	254.3	158.4	20:03	23.8	136.7	157.8
2010:09:14	04:14	-5.0	256.9	155.4	19:57	24.6	138.1	154.8
2010:09:17	04:18	-7.9	259.4	152.4	19:51	25.3	139.6	151.8
2010:09:20	04:21	-10.8	262.0	149.4	19:46	26.0	141.1	148.8
2010:09:23	04:25	-13.7	264.5	146.4	19:40	26.8	142.6	145.8
2010:09:26	04:28	-16.6	267.0	143.4	19:34	27.5	144.2	142.8
2010:09:29	04:32	-19.5	269.6	140.4	19:29	28.1	145.8	139.8
2010:10:02	04:35	-22.4	272.2	137.4	19:24	28.8	147.5	136.8
2010:10:05	04:39	-25.3	274.8	134.4	19:18	29.4	149.3	133.8
2010:10:08	04:42	-28.2	277.5	131.4	19:13	30.1	151.1	130.8
2010:10:11	04:45	-31.0	280.3	128.4	19:08	30.7	152.9	127.8
2010:10:14	04:49	-33.8	283.2	125.4	19:04	31.2	154.9	124.8
2010:10:17	04:52	-36.5	286.2	122.4	18:59	31.8	156.9	121.8
2010:10:20	04:55	-39.2	289.5	119.3	18:55	32.3	158.9	118.8
2010:10:23	04:58	-41.9	292.9	116.3	18:50	32.8	161.1	115.7
2010:10:26	05:02	-44.5	296.5	113.3	18:46	33.2	163.3	112.7
2010:10:29	05:05	-46.9	300.4	110.3	18:43	33.6	165.6	109.7
2010:11:01	05:08	-49.3	304.6	107.3	18:39	34.0	168.1	106.7
2010:11:04	05:11	-51.6	309.2	104.3	18:36	34.3	170.5	103.7
2010:11:07	05:15	-53.7	314.1	101.3	18:33	34.5	173.1	100.7
2010:11:10	05:18	-55.6	319.5	98.3	18:30	34.7	175.8	97.7
2010:11:13	05:21	-57.3	325.3	95.2	18:28	34.8	178.6	94.7
2010:11:16	05:24	-58.7	331.6	92.2	18:26	34.8	181.4	91.7
2010:11:19	05:27	-59.9	338.3	89.2	18:24	34.7	184.3	88.7
2010:11:22	05:30	-60.7	345.4	86.2	18:22	34.5	187.3	85.7
2010:11:25	05:33	-61.3	352.7	83.2	18:21	34.2	190.4	82.7
2010:11:28	05:36	-61.4	0.1	80.2	18:20	33.8	193.5	79.7
2010:12:01	05:39	-61.2	7.4	77.2	18:19	33.3	196.7	76.7
2010:12:04	05:41	-60.7	14.5	74.2	18:19	32.6	199.9	73.7
2010:12:07	05:44	-59.9	21.2	71.2	18:19	31.9	203.1	70.7
2010:12:10	05:46	-58.8	27.6	68.2	18:19	31.0	206.3	67.7
2010:12:13	05:49	-57.5	33.4	65.2	18:20	29.9	209.5	64.7
2010:12:16	05:51	-55.9	38.8	62.2	18:21	28.7	212.7	61.7
2010:12:19	05:52	-54.3	43.7	59.2	18:22	27.4	215.9	58.7
2010:12:22	05:54	-52.5	48.2	56.3	18:23	26.0	219.0	55.7
2010:12:25	05:55	-50.6	52.2	53.3	18:25	24.4	222.1	52.8
2010:12:28	05:56	-48.7	55.9	50.3	18:27	22.7	225.2	49.8
2010:12:31	05:57	-46.8	59.3	47.3	18:29	20.9	228.2	46.8

Morning twilights = crepuscolo mattutino  
Evening twilight = crepuscolo serale

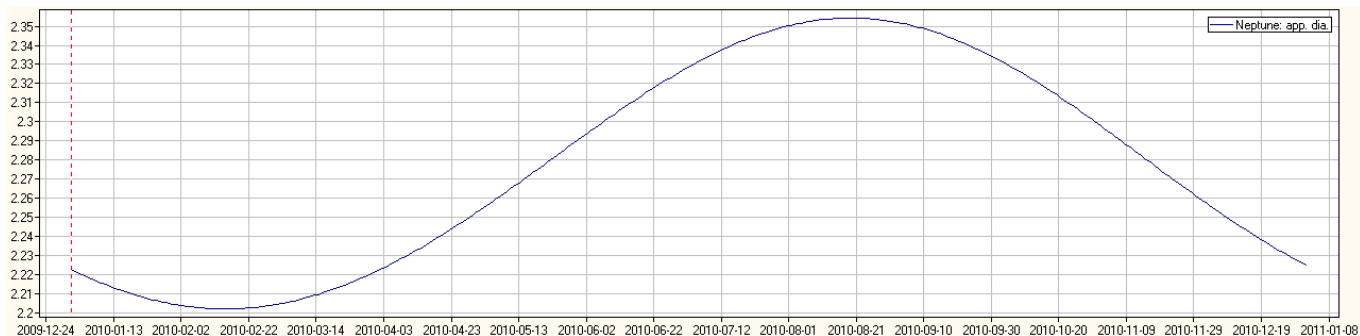
Date = data nel formato aaaa/mm/gg  
Times = ore



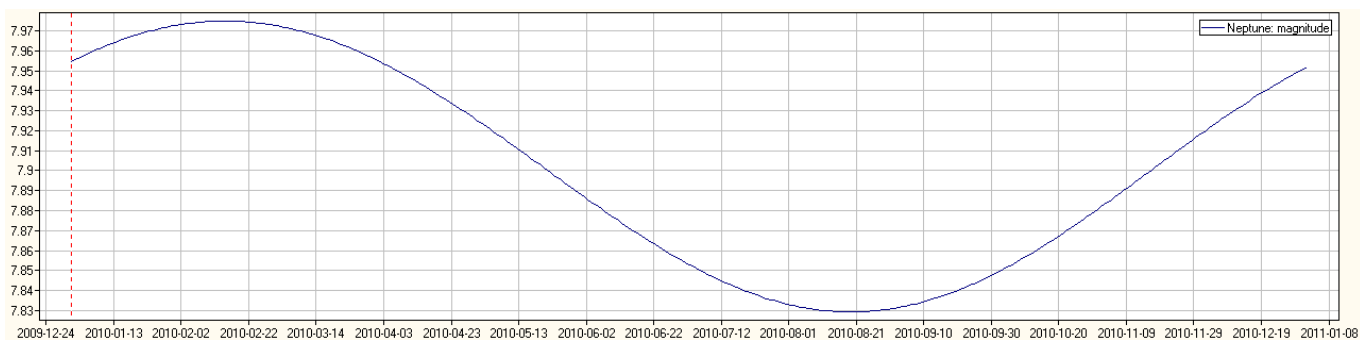
Distanza di Nettuno in U.A. nel corso dell'anno - Distance of Neptune in A.U. during the year



Elongazione di Nettuno in ° nel corso dell'anno - Elongation of Neptune in ° during the year



Diametro di Nettuno in " nel corso dell'anno - Diameter of Neptune in " during the year



Magnitudine di Nettuno nel corso dell'anno - Magnitude of Neptune during the year

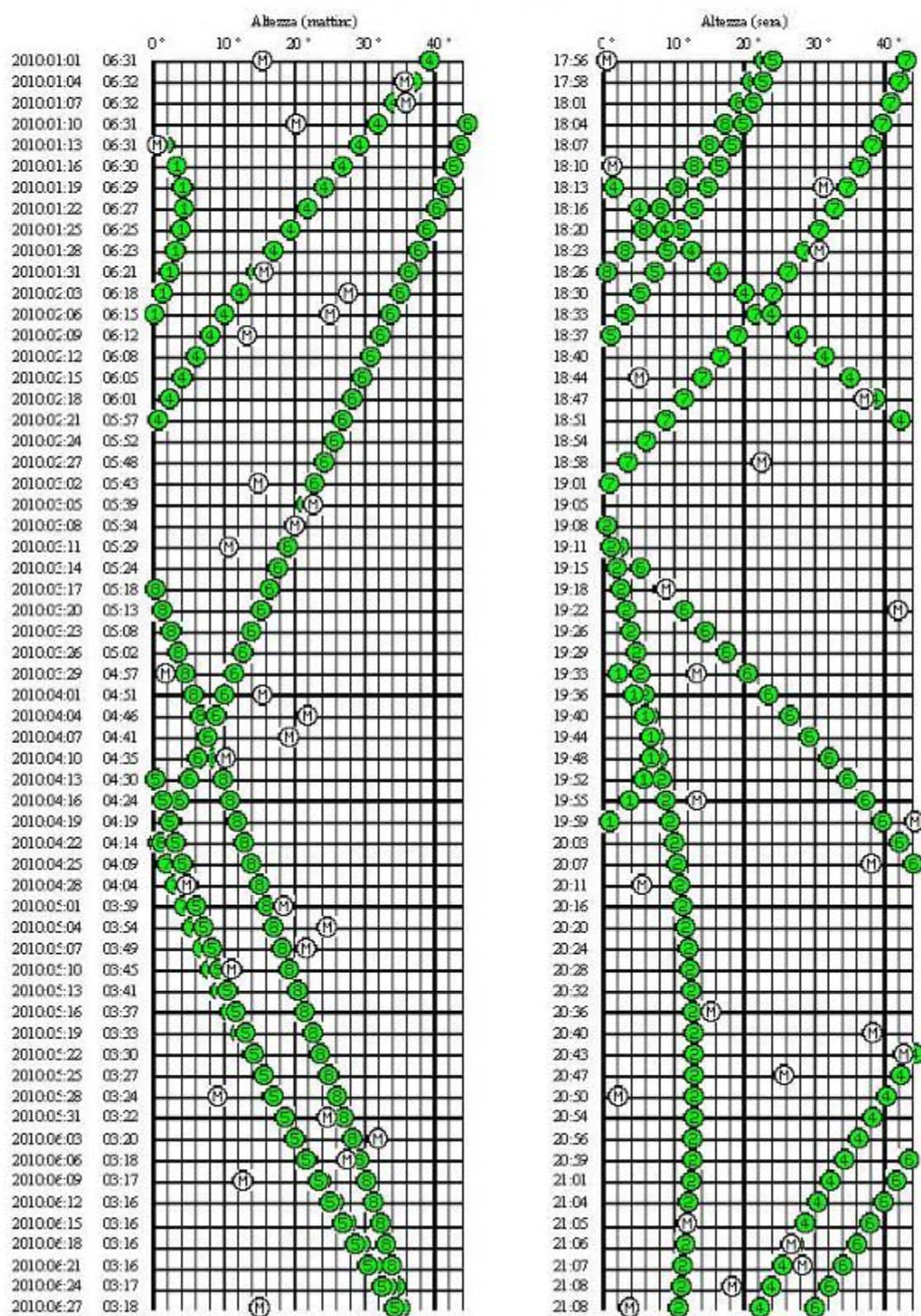


# Altezza ai crepuscoli

## di Luna e Pianeti

nel momento il cui il Sole è 12 ° sotto l'orizzonte

Postazione: IT-Rome 41:53 N, 12:30 E (UT +01:00)



1 = Mercurio, 2 = Venere, 4 = Marte, 5 = Giove, 6 = Saturno, 7 = Urano, 8 = Nettuno, M = Luna

1 = Mercury , 2 = Venus , 4 = Mars , 5 = Jupiter, 6 = Saturn , 7 = Uranus, 8 = Neptune, M = Moon

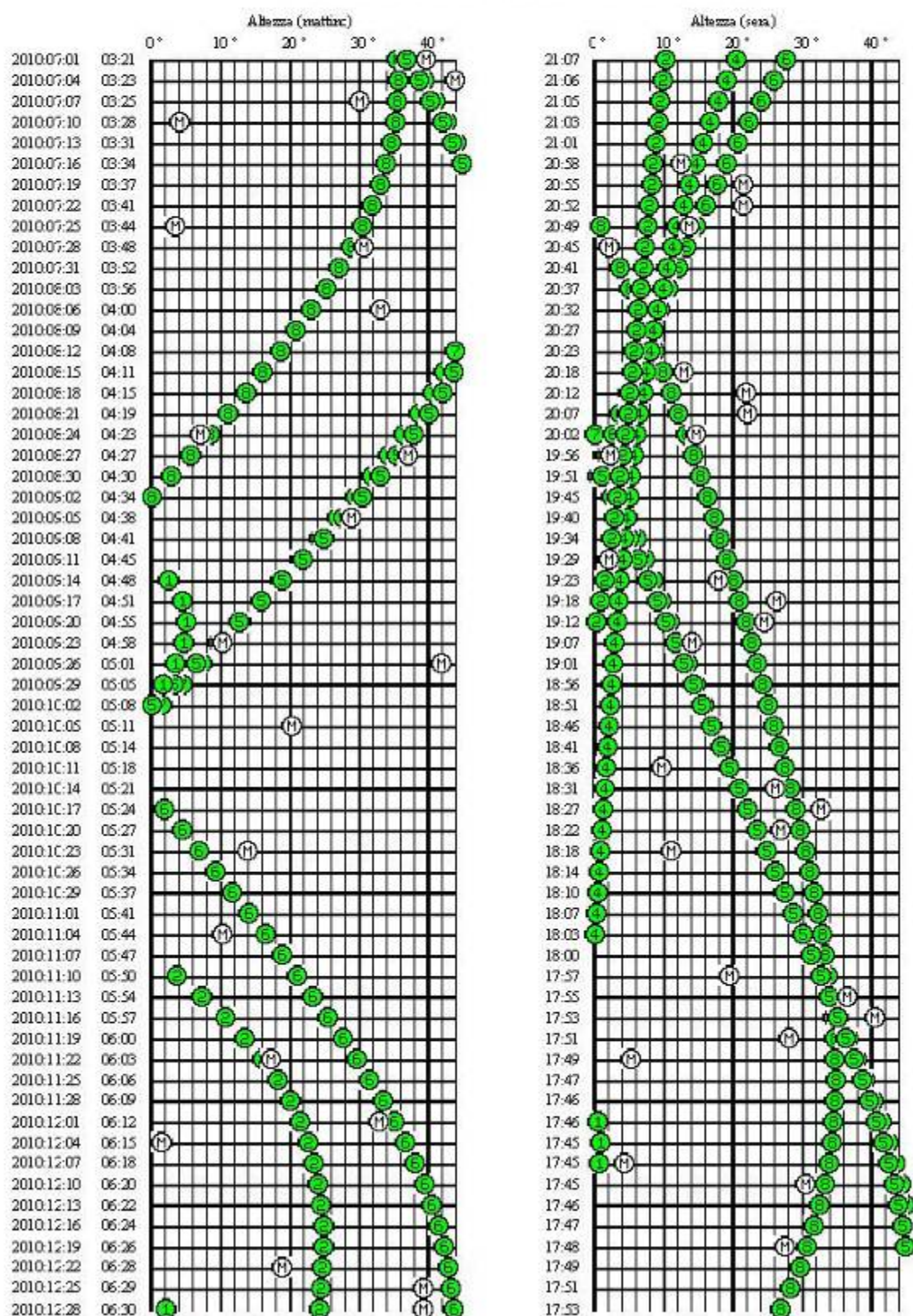


# Altezza ai crepuscoli

## di Luna e Pianeti

nel momento il cui il Sole è 12 ° sotto l'orizzonte

Postazione: IT-Rome 41:53 N, 12:30 E (UT +01:00)



1 = Mercurio, 2 = Venere, 4 = Marte, 5 = Giove, 6 = Saturno, 7 = Urano, 8 = Nettuno, M = Luna

1 = Mercury , 2 = Venus , 4 = Mars , 5 = Jupiter, 6 = Saturn , 7 = Uranus, 8 = Neptune, M = Moon

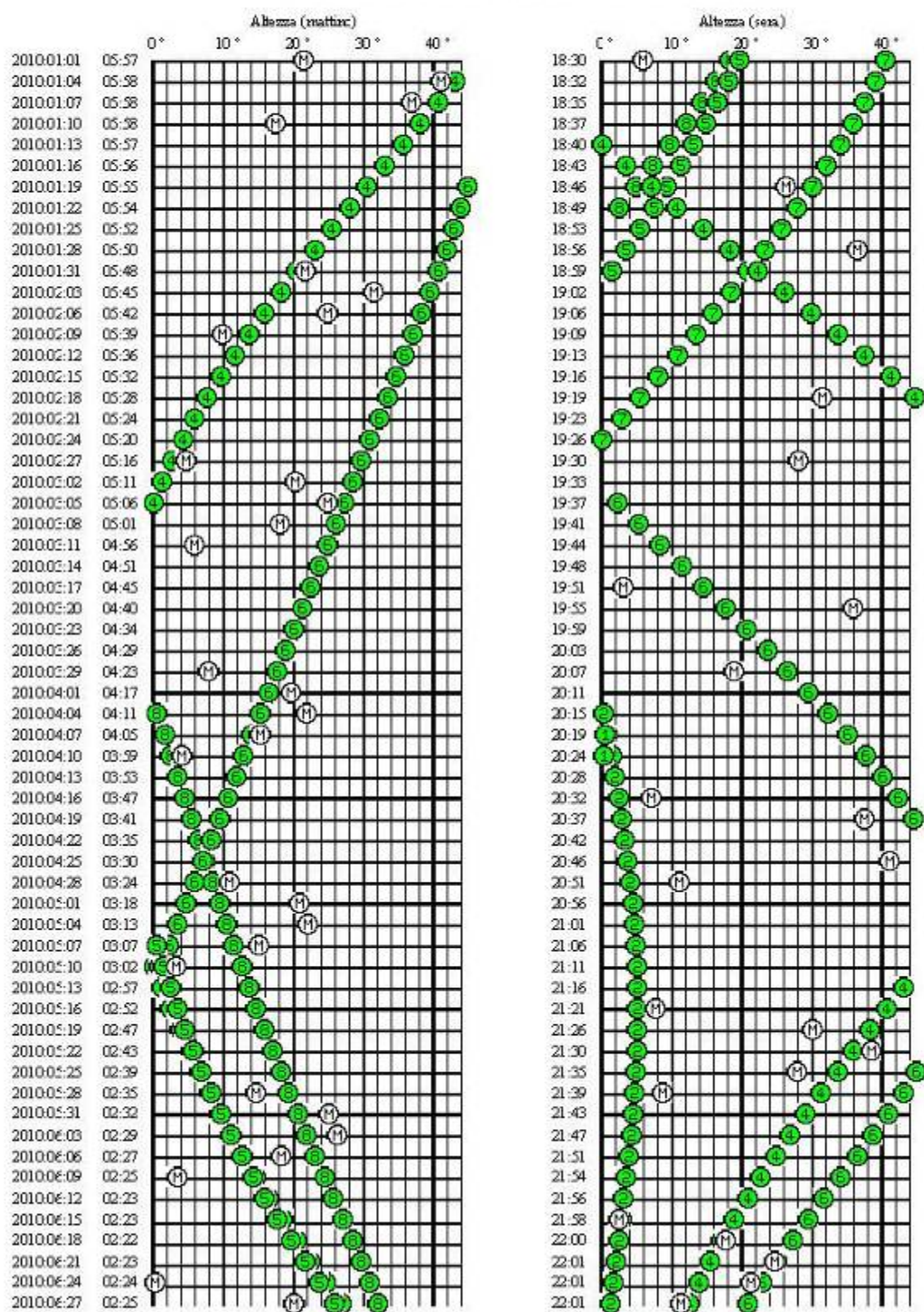


# Altezza ai crepuscoli

## di Luna e Pianeti

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT-Rome 41:53 N, 12:30 E (UT +01:00)



1 = Mercurio, 2 = Venere, 4 = Marte, 5 = Giove, 6 = Saturno, 7 = Urano, 8 = Nettuno, M = Luna

1 = Mercury , 2 = Venus , 4 = Mars , 5 = Jupiter, 6 = Saturn , 7 = Uranus, 8 = Neptune, M = Moon

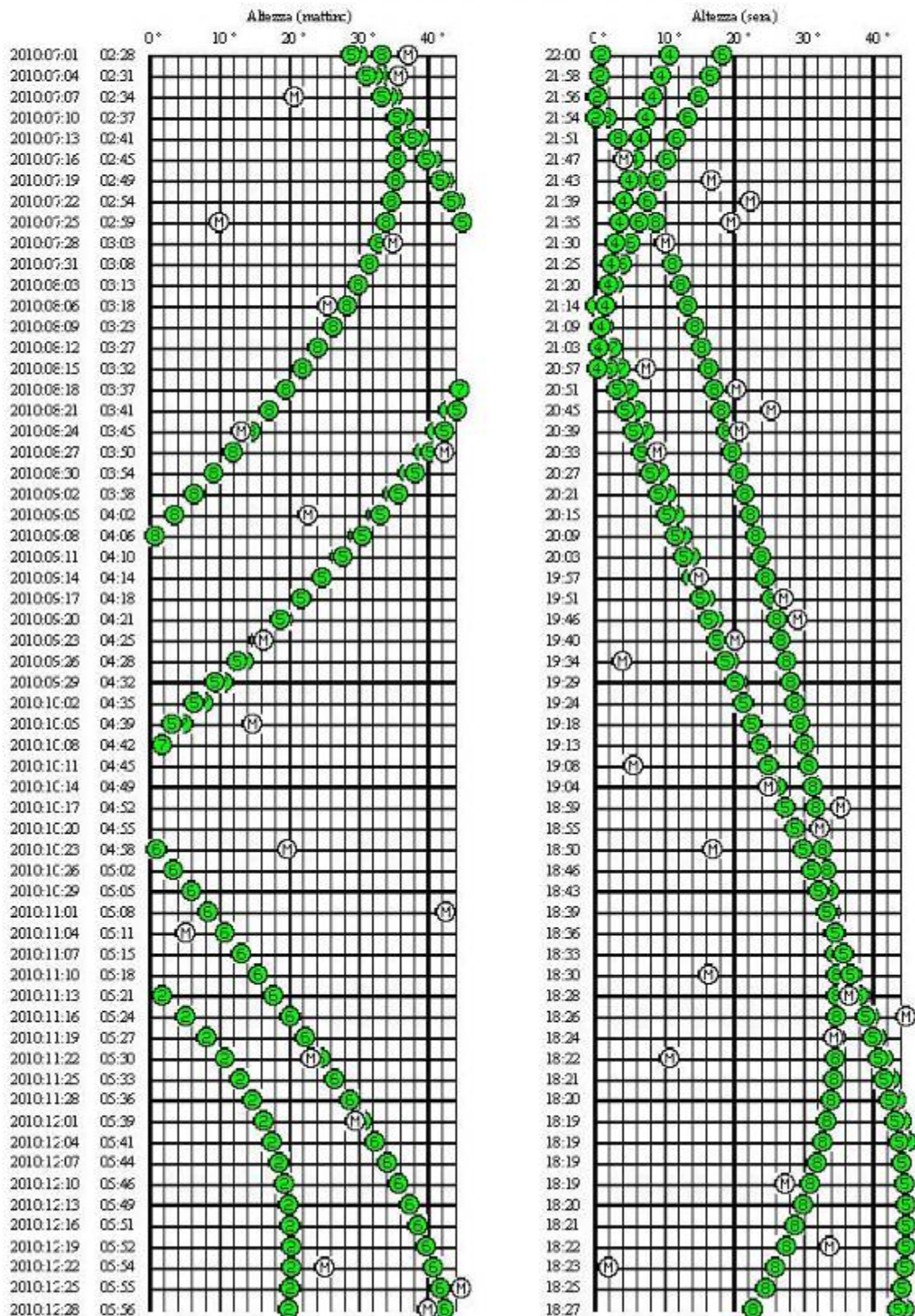


# Altezza ai crepuscoli

## di Luna e Pianeti

nel momento il cui il Sole è 18 ° sotto l'orizzonte

Postazione: IT:Rome 41:53 N, 12:30 E (UT +01:00)



1 = Mercurio, 2 = Venere, 4 = Marte, 5 = Giove, 6 = Saturno, 7 = Urano, 8 = Nettuno, M = Luna

1 = Mercury , 2 = Venus , 4 = Mars , 5 = Jupiter, 6 = Saturn , 7 = Uranus, 8 = Neptune, M = Moon

VISIBILITA' CONTEMPORANEE  
CONTEMPORARY VISIBILITY

42°N - 12°E

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2010 05 09	0	0	0	1	1	0	1	1
2010 05 10	0	0	0	1	1	0	1	1
2010 05 26	0	0	0	1	0	1	1	1
2010 05 27	0	0	0	1	0	1	1	1
2010 05 28	0	0	0	1	0	1	1	1
2010 05 29	0	0	0	1	0	1	1	1
2010 05 30	0	0	0	1	0	1	1	1
2010 05 31	0	0	0	1	0	1	1	1
2010 06 01	0	0	0	1	0	1	1	1
2010 06 02	0	0	0	1	0	1	1	1
2010 06 03	0	0	0	1	0	1	1	1
2010 06 04	0	0	0	1	0	1	1	1
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2010 06 26	0	0	0	1	0	1	1	1
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2010 06 28	0	0	0	1	0	1	1	1
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2010 07 31	0	0	0	1	0	1	1	1
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2010 09 02	0	0	0	1	0	1	1	1
2010 09 03	0	0	0	1	0	1	1	1
2010 09 04	0	0	0	1	0	1	1	1
2010 09 05	0	0	0	1	0	1	1	1
2010 09 06	0	0	0	1	0	1	1	1

4	AL	TRAMONTO	M	V	M	G	S	U	N	L
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2010	01	16	0	0	1	1	0	1	1	0
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2010	01	24	0	0	1	1	0	1	1	1
2010	01	25	0	0	1	1	0	1	0	0
2010	01	26	0	0	1	1	0	1	0	0
2010	01	27	0	0	1	1	0	1	0	1
2010	01	28	0	0	1	1	0	1	0	1
2010	01	29	0	0	1	1	0	1	0	1
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2010	04	23	0	1	1	0	1	0	0	1
2010	04	24	0	1	1	0	1	0	0	1
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2010	04	27	0	1	1	0	1	0	0	1
2010	04	28	0	1	1	0	1	0	0	1
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2010	06	16	0	1	1	0	1	0	0	1
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2010	08	07	0	0	1	0	1	1	1	0
2010	08	08	0	0	1	0	1	1	1	0
2010	08	09	0	0	1	0	1	1	1	0
2010	08	12	0	0	1	0	1	1	1	0
2010	08	14	0	0	0	1	0	1	1	1
2010	08	15	0	0	0	1	0	1	1	1
2010	08	16	0	0	0	1	0	1	1	1
2010	08	17	0	0	0	1	0	1	1	1
2010	08	18	0	0	0	1	0	1	1	1
2010	08	19	0	0	0	1	0	1	1	1

5	AL	TRAMONTO	M	V	M	G	S	U	N	L
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2010	01	21	0	0	1	1	0	1	1	1
2010	01	22	0	0	1	1	0	1	1	1
2010	01	23	0	0	1	1	0	1	1	1
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4	AL	TRAMONTO	M	V	M	G	S	U	N	L
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2010	12	09	0	0	0	1	0	1	1	1
2010	12	10	0	0	0	1	0	1	1	1
2010	12	11	0	0	0	1	0	1	1	1
2010	12	12	0	0	0	1	0	1	1	1
2010	12	13	0	0	0	1	0	1	1	1
2010	12	14	0	0	0	1	0	1	1	1
2010	12	15	0	0	0	1	0	1	1	1
2010	12	16	0	0	0	1	0	1	1	1
2010	12	17	0	0	0	1	0	1	1	1
2010	12	18	0	0	0	1	0	1	1	1
2010	12	19	0	0	0	1	0	1	1	1
2010	12	20	0	0	0	1	0	1	1	1
2010	12	21	0	0	0	1	0	1	1	1
2010	12	22	0	0	0	1	0	1	1	1

M = Mercurio - Mercury  
V = Venere - Venus  
M = Marte - Mars  
G = Giove - Jupiter  
S = Saturno - Saturn  
U = Urano - Uranus  
N = Nettuno - Neptune  
L = Luna - Moon

Nei giorni indicati con il valore "1" saranno visibili all'alba o al tramonto più pianeti contemporaneamente

In the days with the value "1" they will be contemporarily visible in the morning (all'alba) or in the evening (al tramonto) more planets. (Valid for Rome)

# EVENTI GEOCENTRICI <5° TRA PIANETI

## GEOCENTRIC EVENTS <5° BETWEEN PLANETS

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)	tw(h)		
2010/01/05 07:45:38		3.42803	0.00495	0.672	1.710	180	-3	3.6	-3.9		33.3	Mercury	Venus
2010/02/08 05:36:08		1.00171	0.00301	1.698	31.003	341	7	-3.9	8.0		96.7	Venus	Neptune
2010/02/17 02:16:01		0.53495	0.00689	1.688	5.967	338	9	-3.9	-1.9		118.0	Venus	Jupiter
2010/02/27 13:48:25		1.70543	0.00270	1.352	30.991	341	-12	-0.7	8.0		68.5	Mercury	Neptune
2010/03/04 04:18:24		0.61159	0.00318	1.662	21.063	336	12	-3.9	5.9		100.1	Venus	Uranus
2010/03/08 02:15:47		1.07313	0.00652	1.372	5.975	336	-6	-1.2	-1.9		73.5	Mercury	Jupiter
2010/03/15 22:10:54		0.66000	0.00281	1.348	21.090	333	2	-1.6	5.9		62.1	Mercury	Uranus
2010/04/04 08:23:39		2.99617	0.00330	0.999	1.575	124	18	-0.5	-3.9		446.3	Mercury	Venus
2010/06/08 08:16:05		0.43674	0.00604	5.098	20.297	338	-77	-2.2	5.9		1092.6	Jupiter	Uranus
2010/07/31 06:26:06		1.76102	0.00384	1.989	10.116	25	53	1.3	0.6		215.6	Mars	Saturn
2010/08/08 10:35:53		2.73427	0.00807	0.777	10.219	29	46	-4.2	0.6		107.6	Venus	Saturn
2010/08/19 04:37:02		1.87947	0.00634	0.692	2.090	39	46	-4.3	1.4		323.7	Venus	Mars
2010/09/18 23:21:18		0.80888	0.00772	3.954	19.089	336	-177	-2.8	5.7		1270.4	Jupiter	Uranus
2010/10/08 11:17:29		0.53068	0.00438	1.350	10.551	26	-7	-1.3	0.7		72.1	Mercury	Saturn
2010/11/20 15:55:52		1.65900	0.00227	1.224	2.356	8	19	-0.4	1.2		174.6	Mercury	Mars
2010/12/14 00:23:44		1.01754	0.00410	0.736	2.374	191	13	0.5	1.2		80.7	Mercury	Mars

## OCCULTAZIONI TRA PIANETI

### OCCULTATION BETWEEN PLANETS

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)	tw(h)
------	----	----	----	----	----	---	---	----	----	-------	-------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei pianeti

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i pianeti

R1 = distanza in U.A. del corpo 1 dalla Terra

R2 = distanza in U.A. del corpo 2 dalla Terra

P = angolo di posizione tra i pianeti, in gradi

e = elongazione, in gradi

m1 = magnitudine del primo pianeta

m2 = magnitudine del secondo pianeta

tm = se presente, uno dei pianeti viene occultato massimo per x secondi

tw = semiperiodo in ore in cui i due pianeti distano meno di 5° tra loro

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the planets

Dl = parameter limit, if Dm < Dl there is an occultation between the planets

R1 = distance in A.U. of the body 1 from the Earth

R2 = distance in A.U. of the body 2 from the Earth

P = angle of position between the planets, in °

e = elongation, in degree

m1 = magnitude of the first planet

m2 = magnitude of the second planet

tm = if present, one of the planets is occulted maximum for x seconds

tw = semiperiod in hours in which the two planets are near less than 5°

# CONGIUNZIONI MULTIPLE PLANETARIE

(eventi con 3 o più pianeti entro 5°)

## MULTIPLE PLANETARY CONJUNCTIONS

(events with 3 or more planets within 5°)

Date	TT	Dmed	Dmax	emin	m2d	mmax			
2010/08/08	02:06:26	4.061	4.708	46	0.6	1.3	Venus	Mars	Saturn

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri dei pianeti, in gradi

Dmax = diametro del cerchio comprendente i pianeti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo pianeta più debole

mmax = magnitudine del pianeta più debole

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dmed = middle distance between the center of the planets, in gradi

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest planet

mmax = least magnitude

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Per le congiunzioni multiple stellari o lunari consultare più avanti



# CONGIUNZIONI MULTIPLE MISTE

## CERCHI MINIMI TOPOCENTRICI TRA PIANETI

## MULTIPLE CONJUNCTIONS

## LEAST TOPOCENTRIC GROUPING BETWEEN PLANETS

42°N - 12°E

DATE	TIME		BODIES			D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
07	10	2010 06	VENUS	MARS	SATURN	5.0	2.9	4.0	5.0	48	-4.2	1.5	1.1	-4.2	-25	67	10	77
07	10	2010 07	VENUS	MARS	SATURN	5.0	2.9	4.0	5.0	48	-4.2	1.5	1.1	-4.2	-15	78	19	88
07	10	2010 08	VENUS	MARS	SATURN	5.0	2.9	4.0	5.0	48	-4.2	1.5	1.1	-4.2	-4	88	28	101
07	10	2010 09	VENUS	MARS	SATURN	4.9	2.9	4.1	5.0	48	-4.2	1.5	1.1	-4.2	8	98	36	115
07	10	2010 10	VENUS	MARS	SATURN	4.9	2.8	4.1	5.0	48	-4.2	1.5	1.1	-4.2	18	109	44	131
07	10	2010 11	VENUS	MARS	SATURN	4.9	2.8	4.1	5.0	48	-4.2	1.5	1.1	-4.2	29	122	49	151
07	10	2010 12	VENUS	MARS	SATURN	4.9	2.8	4.1	4.9	47	-4.2	1.5	1.1	-4.2	38	137	52	173
07	10	2010 13	VENUS	MARS	SATURN	4.9	2.8	4.1	4.9	47	-4.2	1.5	1.1	-4.2	44	155	51	197
07	10	2010 14	VENUS	MARS	SATURN	4.9	2.8	4.2	4.9	47	-4.2	1.5	1.1	-4.2	47	176	47	218
07	10	2010 15	VENUS	MARS	SATURN	4.8	2.8	4.2	4.9	47	-4.2	1.5	1.1	-4.2	47	198	40	236
07	10	2010 16	VENUS	MARS	SATURN	4.8	2.8	4.2	4.9	47	-4.2	1.5	1.1	-4.2	42	217	32	251
07	10	2010 17	VENUS	MARS	SATURN	4.8	2.8	4.2	4.9	47	-4.2	1.5	1.1	-4.2	34	233	24	264
07	10	2010 18	VENUS	MARS	SATURN	4.8	2.8	4.2	4.9	47	-4.2	1.5	1.1	-4.2	25	246	15	276
07	10	2010 19	VENUS	MARS	SATURN	4.8	2.8	4.3	4.9	47	-4.2	1.5	1.1	-4.2	14	257	6	288
07	10	2010 20	VENUS	MARS	SATURN	4.8	2.7	4.3	4.9	47	-4.2	1.5	1.1	-4.2	3	267	-1	300
07	10	2010 21	VENUS	MARS	SATURN	4.7	2.7	4.3	4.9	47	-4.2	1.5	1.1	-4.2	-8	278	-8	312
07	10	2010 22	VENUS	MARS	SATURN	4.7	2.7	4.3	4.8	47	-4.2	1.5	1.1	-4.2	-19	288	-14	326
07	10	2010 23	VENUS	MARS	SATURN	4.7	2.7	4.3	4.8	47	-4.2	1.5	1.1	-4.2	-29	301	-18	340
08	10	2010 00	VENUS	MARS	SATURN	4.7	2.7	4.4	4.8	47	-4.2	1.5	1.1	-4.2	-38	316	-20	355
08	10	2010 01	VENUS	MARS	SATURN	4.7	2.7	4.4	4.8	47	-4.2	1.5	1.1	-4.2	-45	334	-19	11
08	10	2010 02	VENUS	MARS	SATURN	4.7	2.7	4.4	4.8	47	-4.2	1.5	1.1	-4.2	-48	356	-16	26
08	10	2010 03	VENUS	MARS	SATURN	4.6	2.7	4.4	4.8	47	-4.2	1.5	1.1	-4.2	-47	19	-12	40
08	10	2010 04	VENUS	MARS	SATURN	4.6	2.7	4.4	4.8	47	-4.2	1.5	1.1	-4.2	-42	38	-5	53
08	10	2010 05	VENUS	MARS	SATURN	4.6	2.7	4.5	4.8	47	-4.2	1.5	1.1	-4.2	-35	54	2	65
08	10	2010 06	VENUS	MARS	SATURN	4.6	2.7	4.5	4.8	47	-4.2	1.5	1.1	-4.2	-25	67	10	77
08	10	2010 07	VENUS	MARS	SATURN	4.6	2.7	4.5	4.8	47	-4.2	1.5	1.1	-4.2	-14	78	19	89
08	10	2010 08	VENUS	MARS	SATURN	4.6	2.7	4.5	4.8	47	-4.2	1.5	1.1	-4.2	-3	89	28	101
08	10	2010 09	VENUS	MARS	SATURN	4.6	2.7	4.5	4.8	47	-4.2	1.5	1.1	-4.2	8	99	36	115
08	10	2010 10	VENUS	MARS	SATURN	4.5	2.7	4.6	4.8	47	-4.2	1.5	1.1	-4.2	19	110	44	131
08	10	2010 11	VENUS	MARS	SATURN	4.5	2.7	4.6	4.8	47	-4.2	1.5	1.1	-4.2	29	122	49	151
08	10	2010 12	VENUS	MARS	SATURN	4.5	2.7	4.6	4.8	47	-4.2	1.5	1.1	-4.2	38	137	52	173
08	10	2010 13	VENUS	MARS	SATURN	4.5	2.7	4.6	4.8	47	-4.2	1.5	1.1	-4.2	44	155	51	197
08	10	2010 14	VENUS	MARS	SATURN	4.5	2.7	4.6	4.8	47	-4.2	1.5	1.1	-4.2	47	176	47	218
08	10	2010 15	VENUS	MARS	SATURN	4.5	2.7	4.7	4.8	47	-4.2	1.5	1.1	-4.2	46	198	40	236
08	10	2010 16	VENUS	MARS	SATURN	4.4	2.7	4.7	4.8	47	-4.2	1.5	1.1	-4.2	41	217	32	251
08	10	2010 17	VENUS	MARS	SATURN	4.4	2.7	4.7	4.8	47	-4.2	1.5	1.1	-4.2	34	233	23	264
08	10	2010 18	VENUS	MARS	SATURN	4.4	2.7	4.7	4.9	47	-4.2	1.5	1.1	-4.2	24	246	15	276
08	10	2010 19	VENUS	MARS	SATURN	4.4	2.7	4.7	4.9	47	-4.2	1.5	1.1	-4.2	14	257	6	288
08	10	2010 20	VENUS	MARS	SATURN	4.4	2.7	4.8	4.9	47	-4.2	1.5	1.1	-4.2	3	267	-1	300
08	10	2010 21	VENUS	MARS	SATURN	4.4	2.7	4.8	4.9	47	-4.2	1.5	1.1	-4.2	-9	277	-9	312
08	10	2010 22	VENUS	MARS	SATURN	4.3	2.7	4.8	4.9	47	-4.2	1.5	1.1	-4.2	-20	288	-14	326
08	10	2010 23	VENUS	MARS	SATURN	4.3	2.7	4.8	4.9	47	-4.2	1.5	1.1	-4.2	-30	300	-18	340
09	10	2010 00	VENUS	MARS	SATURN	4.3	2.7	4.8	4.9	47	-4.2	1.5	1.1	-4.2	-39	315	-20	355
09	10	2010 01	VENUS	MARS	SATURN	4.3	2.7	4.9	4.9	47	-4.2	1.5	1.1	-4.2	-45	334	-20	11
09	10	2010 02	VENUS	MARS	SATURN	4.3	2.7	4.9	5.0	47	-4.2	1.5	1.1	-4.2	-49	356	-17	26
09	10	2010 03	VENUS	MARS	SATURN	4.3	2.8	4.9	5.0	47	-4.2	1.5	1.1	-4.2	-47	19	-12	40
09	10	2010 04	VENUS	MARS	SATURN	4.3	2.8	4.9	5.0	47	-4.2	1.5	1.1	-4.2	-42	39	-5	53
09	10	2010 05	VENUS	MARS	SATURN	4.2	2.8	4.9	5.0	47	-4.2	1.5	1.1	-4.2	-35	55	2	65
09	10	2010 06	VENUS	MARS	SATURN	4.2	2.8	5.0	5.0	47	-4.2	1.5	1.1	-4.2	-25	68	10	77
09	10	2010 07	VENUS	MARS	SATURN	4.2	2.8	5.0	5.0	47	-4.2	1.5	1.1	-4.2	-14	79	19	89

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimuth del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi      AZ.S. = azimuth del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Ore in T.U.

Date in the format day/month/year

Dxy = distance between the body x and y, in °

GROUP = least group, in degree

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °      AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# 3 PIANETI IN LINEA RETTA

## 3 PLANETS IN STRAIGHT LINE

DATE	TIMES	BODIES	C	ALT	AZ	ALT.S.	AZ.S
------	-------	--------	---	-----	----	--------	------

Questo anno non avvengono fenomeni - No phenomena this year

Quanto più il parametro C è prossimo a zero tanto più i corpi sono allineati

Date, Time = data ed ora

Bodies = corpi

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

How much anymore the parameter C is next to zero so much the bodies are lined up

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# GEOMETRIE SPAZIALI PLANETARIE

## TRIANGOLI EQUILATERI

# PLANETARY SPATIAL GEOMETRIES

## EQUILATERAL TRIANGLES

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
Questo anno non avvengono fenomeni - No phenomena this year															

# GEOMETRIE SPAZIALI PLANETARIE - QUADRATI

## PLANETARY SPATIAL GEOMETRIES - SQUARES

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
Questo anno non avvengono fenomeni - No phenomena this year															

Date, Time = data ed ora  
 Bodies = corpi  
 Dxy = distanza tra il corpo x e quello y, in gradi  
 DQM = distanza media tra i 4 corpi, in gradi  
 MAX = distanza massima tra i 4 corpi, in gradi  
 Group = cerchio minimo comprendente tutto il gruppo, in gradi  
 EL = elongazione dal Sole, in gradi  
 MAGx = magnitudine del corpo x  
 MAGT = magnitudine totale del gruppo  
 ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi  
 AZ = azimut del baricentro geometrico del gruppo, in gradi da nord  
 ALT.S. = altezza sull'orizzonte del Sole, in gradi  
 AZ.S. = azimut del Sole, in gradi da nord  
 Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
 Moon=Luna

Ore in T.U.

Si è considerato equilatero ogni triangolo in cui ogni cateto differisce dall'altro per massimo  $\pm 10\%$ .  
 Si è considerato quadrato ogni quadrilatero in cui ogni lato differisce dall'altro per massimo  $\pm 10\%$  e con diagonali diverse meno del 15%.

NB : queste tabelle sono state create esclusivamente ai fini di "foto d'effetto", con tre o quattro corpi celesti praticamente equidistanti!

Dxy = distance between the body x and y, in °  
 DQM = middle distance between the 4 bodies, in °  
 MAX = maxima distance between the 4 bodies, in °  
 GROUP = least group, in degree  
 EL = elongation from the Sun, in °  
 MAGx = magnitude of body x  
 MAGT = total magnitude  
 ALT = height on the horizon of the baricenter of the group, in °  
 AZ = azimuth of the baricenter of the group, in ° from north  
 ALT.S. = height on the horizon of the Sun, in °  
 AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

I have considered equilateral every triangle in which every cathetus differs from the other for maximum  $\pm 10\%$ .  
 I have considered square every quadrilateral in which every side differs from the other for maximum  $\pm 10\%$  and with diagonal different less than 15%.

NB: these charts are been created exclusively to the goals of "photo of effect", with three or four equidistant celestial bodies!

# CONGIUNZIONI GEOCENTRICHE <0,2°

## PIANETI-STELLE m<6

# GEOCENTRIC CONJUNCTIONS <0,2°

## PLANETS-STARS m<6

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)			
2010/01/01 21:52:37		0.11207	0.00279	1.709	358	-2	-3.9	5.8		Venus		
2010/01/23 10:39:15		0.02670	0.00361	0.934	8	-24	0.0	6.0		Mercury		
2010/01/29 18:38:05		0.19572	0.00322	1.046	2	-25	0.0	3.8		Mercury	Omicron	SGR
2010/02/01 19:50:53		0.02235	0.00279	1.704	163	5	-3.9	4.3		Venus	Iota	CAP
2010/02/02 23:32:04		0.15884	0.00303	1.112	358	-24	-0.0	5.6		Mercury		SGR
2010/02/22 05:47:57		0.19804	0.00509	0.734	5	148	-1.0	5.9		Mars	Lambda	CNC
2010/02/28 22:03:42		0.06672	0.00249	1.357	340	-12	-0.8	4.3		Mercury	Iota	AQR
2010/03/02 12:04:08		0.14859	0.00248	1.363	339	-10	-0.8	5.4		Mercury		AQR
2010/03/04 13:34:42		0.01095	0.00287	1.661	156	13	-3.9	5.5		Venus		PSC
2010/03/15 19:34:08		0.05428	0.00250	1.348	333	2	-1.6	5.5		Mercury		PSC
2010/03/17 07:43:08		0.14063	0.00291	8.507	24	-174	0.2	6.0		Saturn		VIR
2010/03/21 01:26:45		0.08155	0.00260	1.298	152	6	-1.6	5.8		Mercury		PSC
2010/03/24 08:50:36		0.16216	0.00270	1.249	332	10	-1.5	5.8		Mercury		
2010/03/31 14:49:24		0.19460	0.00300	1.588	338	19	-3.9	5.9		Venus		
2010/04/01 07:25:46		0.07668	0.00496	5.879	157	-24	-2.0	4.3		Jupiter	Phi	AQR
2010/04/09 13:01:55		0.17205	0.00306	1.556	340	21	-3.9	6.0		Venus		ARI
2010/05/08 09:53:10		0.14623	0.00334	1.424	352	28	-3.8	5.8		Venus		TAU
2010/05/10 09:01:49		0.15212	0.00337	1.414	353	29	-3.8	5.5		Venus		TAU
2010/05/23 12:02:20		0.03245	0.00435	0.776	162	-25	0.5	5.5		Mercury	Xi	ARI
2010/05/28 23:28:55		0.02776	0.00388	0.869	340	-25	0.3	5.2		Mercury		ARI
2010/06/03 01:01:47		0.18229	0.00374	1.273	186	34	-3.9	5.9		Venus		GEM
2010/06/12 16:03:13		0.14163	0.00295	1.143	344	-17	-0.6	5.5		Mercury	Omegal	TAU
2010/06/26 17:26:57		0.01878	0.00256	1.321	357	-2	-1.9	5.8		Mercury		GEM
2010/07/02 01:18:54		0.04942	0.00255	1.324	184	5	-1.7	5.2		Mercury	Omega	GEM
2010/07/03 03:05:20		0.04769	0.00256	1.320	5	6	-1.7	5.9		Mercury		GEM
2010/07/25 14:52:55		0.14894	0.00191	1.956	25	55	1.3	3.6		Mars	Beta	VIR Zavijava
2010/07/31 13:21:57		0.09838	0.00567	0.840	28	45	-4.1	5.8		Venus		LEO
2010/08/11 00:49:36		0.19431	0.00407	0.828	217	27	0.4	4.9		Mercury		LEO
2010/08/27 22:34:59		0.14849	0.00765	0.622	210	46	-4.4	6.0		Venus		VIR
2010/09/02 09:42:12		0.14559	0.00822	0.580	210	45	-4.5	5.3		Venus		VIR
2010/09/16 23:44:13		0.09243	0.00388	0.869	358	-17	-0.1	3.8		Mercury	Rho	LEO
2010/09/24 10:57:10		0.16564	0.00313	1.077	198	-17	-0.7	4.6		Mercury	Chi	LEO
2010/09/27 04:19:53		0.05841	0.00294	1.147	201	-15	-0.9	4.1		Mercury	Sigma	LEO
2010/10/17 18:29:27		0.19428	0.00038	29.480	161	122	7.9	5.1		Neptune	Mu	CAP
2010/10/22 09:39:54		0.03936	0.00162	2.311	195	27	1.3	5.5		Mars		
2010/10/30 19:52:18		0.05579	0.00161	2.327	12	25	1.3	5.9		Mars		
2010/11/07 06:34:55		0.09320	0.00245	1.378	197	13	-0.6	5.8		Mercury		
2010/11/20 10:03:00		0.02593	0.00275	1.227	8	19	-0.4	5.9		Mercury		
2010/11/20 10:34:47		0.13393	0.00275	1.227	8	19	-0.4	5.8		Mercury		
2010/11/27 00:56:35		0.19796	0.00037	30.147	160	81	7.9	5.1		Neptune	Mu	OPH
2010/11/28 01:10:09		0.16790	0.00158	2.363	184	17	1.2	4.2		Mars		OPH
2010/11/29 13:37:39		0.11770	0.00158	2.365	3	16	1.2	4.8		Mars		OPH
2010/12/09 02:28:10		0.02265	0.00158	2.371	0	14	1.2	5.4		Mars		SGR
2010/12/09 09:51:36		0.05496	0.00158	2.372	180	14	1.2	6.0		Mars		SGR
2010/12/11 04:20:04		0.103804	0.00248	9.975	20	-64	0.6	5.8		Saturn		VIR
2010/12/18 09:59:04		0.10333	0.00157	2.376	357	12	1.2	5.5		Mars		SGR
2010/12/30 07:47:51		0.06314	0.00576	5.063	155	78	-2.3	5.5		Jupiter		PSC

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri degli oggetti

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

A.R. e DEC. = coordinate apparenti geocentriche

R1 = distanza in U.A. del pianeta

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del pianeta

m\* = magnitudine della stella

tm = se presente, la stella viene occultata massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

A.R. e DEC. = apparent geocentric coordinates

R1 = distance in A.U. of the planet

P = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the planet

m\* = magnitude of the star

tm = if present, the star is occulted maximum for x seconds

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# CONGIUNZIONI GEOCENTRICHE <5°

## PIANETI-STELLE m<2

# GEOCENTRIC CONJUNCTIONS <5°

## PLANETS-STARS m<2

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)	tw(h)			
2010/05/14 02:03:48		4.04236	0.00342	1.394	355	30	-3.8	1.7		58.7	Venus	Beta	TAU Elnath
2010/06/07 06:27:27		0.82972	0.00232	1.611	203	74	1.1	1.4		227.1	Mars	Alpha	LEO Regulus
2010/06/08 17:49:11		4.70989	0.00385	1.235	10	36	-3.9	1.2		34.2	Venus	Beta	GEM Pollux
2010/06/15 12:42:07		4.50367	0.00283	1.193	166	-15	-0.9	1.0		27.2	Mercury	Alpha	TAU Aldebaran
2010/07/06 09:05:36		4.85846	0.00259	1.301	9	9	-1.3	1.2		13.9	Mercury	Beta	GEM Pollux
2010/07/10 11:51:19		1.00076	0.00474	1.005	203	42	-4.0	1.4		104.6	Venus	Alpha	LEO Regulus
2010/07/27 20:44:56		0.27813	0.00326	1.035	27	25	0.2	1.4		88.0	Mercury	Alpha	LEO Regulus
2010/09/01 02:03:30		1.00408	0.00807	0.590	30	45	-4.5	1.1		136.2	Venus	Alpha	VIR Spica
2010/09/05 22:12:02		2.06772	0.00172	2.170	203	41	1.4	1.1		166.3	Mars	Alpha	VIR Spica
2010/10/17 09:42:11		2.90330	0.00238	1.419	205	1	-1.1	1.1		57.6	Mercury	Alpha	VIR Spica
2010/11/11 01:03:56		3.91409	0.00159	2.345	189	21	1.2	1.1		102.2	Mars	Alpha	SCO Antares
2010/11/15 18:52:39		2.44275	0.00261	1.292	191	17	-0.4	1.1		72.3	Mercury	Alpha	SCO Antares
2010/11/17 17:12:14		3.76834	0.01492	0.319	280	-28	-4.4	1.1		333.1	Venus	Alpha	VIR Spica

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. del pianeta dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del pianeta

m\* = magnitudine della stella

tm = se presente, la stella viene occultata massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di 5° tra loro

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

R1 = distance in A.U. of the planet from the Earth

P = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the planet

m\* = magnitude of the star

tm = if present, the star is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than 5°

# CONGIUNZIONI MULTIPLE PIANETI - STELLE

(eventi con 2 o più pianeti ed una stella di mag<2 entro 5°)

# MULTIPLE CONJUNCTIONS PLANETS - STARS

(events with 2 or more planets and a Messier object within 5°)

Date	TT	Dmed	Dmax	emin	m2d	mmax				
2010/09/02 00:56:48		3.309	4.520	42	1.1	1.4	Venus	Alpha	VIR Spica	Mars
2010/11/15 17:25:48		3.953	5.193	17	1.1	1.2	Mars	Alpha	SCO Antares	Mercury

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dmed = middle distance between the center of the planets, in gradi

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest planet

mmax = least magnitude

# CONGIUNZIONI MULTIPLE MISTE CERCHI MINIMI PIANETI-STELLE

(eventi con 2 o più pianeti ed una stella di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS

# LEAST GROUPING PLANETS-STARS

(events with 2 or more planets and a star with mag<2 within 5°)

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
29	10 2010 22	VENUS MARS α VIR	3.8	2.1	5.0	5.0	44	-4.4	1.5	0.9	-4.4	-29	282	-21	324
30	10 2010 00	VENUS MARS α VIR	3.8	2.0	4.9	5.0	44	-4.4	1.5	0.9	-4.4	-49	311	-27	357
30	10 2010 02	VENUS MARS α VIR	3.8	2.0	4.9	4.9	44	-4.4	1.5	0.9	-4.4	-57	1	-23	29
30	10 2010 04	VENUS MARS α VIR	3.8	1.9	4.8	4.9	44	-4.4	1.5	0.9	-4.4	-47	50	-11	57
30	10 2010 06	VENUS MARS α VIR	3.9	1.8	4.8	4.8	44	-4.4	1.5	0.9	-4.4	-27	78	5	82
30	10 2010 08	VENUS MARS α VIR	3.9	1.8	4.7	4.8	44	-4.4	1.5	0.9	-4.4	-5	99	23	107
30	10 2010 10	VENUS MARS α VIR	3.9	1.7	4.7	4.7	44	-4.4	1.5	0.9	-4.4	16	119	38	137
30	10 2010 12	VENUS MARS α VIR	3.9	1.6	4.6	4.7	44	-4.4	1.5	0.9	-4.4	32	146	45	176
30	10 2010 14	VENUS MARS α VIR	3.9	1.6	4.6	4.6	44	-4.4	1.5	0.9	-4.4	38	181	40	216
30	10 2010 16	VENUS MARS α VIR	4.0	1.5	4.5	4.6	44	-4.4	1.5	0.9	-4.4	31	215	26	247
30	10 2010 18	VENUS MARS α VIR	4.0	1.5	4.5	4.5	44	-4.4	1.5	0.9	-4.4	14	241	8	273
30	10 2010 20	VENUS MARS α VIR	4.0	1.4	4.4	4.5	44	-4.4	1.5	0.9	-4.4	-8	261	-8	297
30	10 2010 22	VENUS MARS α VIR	4.0	1.4	4.4	4.4	44	-4.4	1.5	0.9	-4.4	-30	282	-22	324
31	10 2010 00	VENUS MARS α VIR	4.0	1.3	4.3	4.4	44	-4.4	1.5	0.9	-4.4	-49	311	-27	357
31	10 2010 02	VENUS MARS α VIR	4.0	1.3	4.3	4.3	44	-4.4	1.5	0.9	-4.4	-58	1	-23	29
31	10 2010 04	VENUS MARS α VIR	4.1	1.2	4.2	4.3	44	-4.4	1.5	0.9	-4.4	-47	50	-11	58
31	10 2010 06	VENUS MARS α VIR	4.1	1.2	4.2	4.2	44	-4.4	1.5	0.9	-4.4	-27	79	5	82
31	10 2010 08	VENUS MARS α VIR	4.1	1.1	4.1	4.2	44	-4.4	1.5	0.9	-4.4	-5	99	22	107
31	10 2010 10	VENUS MARS α VIR	4.1	1.1	4.1	4.2	44	-4.4	1.5	0.9	-4.4	16	120	37	137
31	10 2010 12	VENUS MARS α VIR	4.1	1.1	4.0	4.2	44	-4.4	1.5	0.9	-4.4	32	146	44	176
31	10 2010 14	VENUS MARS α VIR	4.2	1.0	4.0	4.2	44	-4.4	1.5	0.9	-4.4	38	181	39	216
31	10 2010 16	VENUS MARS α VIR	4.2	1.0	4.0	4.2	44	-4.4	1.5	0.9	-4.4	30	215	25	247
31	10 2010 18	VENUS MARS α VIR	4.2	1.0	3.9	4.2	44	-4.4	1.5	0.9	-4.4	13	241	8	272
31	10 2010 20	VENUS MARS α VIR	4.2	1.0	3.9	4.3	44	-4.4	1.5	0.9	-4.4	-8	261	-8	297
31	10 2010 22	VENUS MARS α VIR	4.2	1.0	3.8	4.3	44	-4.4	1.5	0.9	-4.4	-30	282	-22	324
01	09 2010 00	VENUS MARS α VIR	4.3	1.0	3.8	4.3	44	-4.4	1.5	0.9	-4.4	-50	311	-28	357
01	09 2010 02	VENUS MARS α VIR	4.3	0.9	3.7	4.3	44	-4.4	1.5	0.9	-4.4	-58	2	-24	30
01	09 2010 04	VENUS MARS α VIR	4.3	1.0	3.7	4.3	44	-4.4	1.5	0.9	-4.4	-48	51	-11	58
01	09 2010 06	VENUS MARS α VIR	4.3	1.0	3.6	4.4	44	-4.4	1.5	0.9	-4.4	-27	79	5	83
01	09 2010 08	VENUS MARS α VIR	4.3	1.0	3.6	4.4	44	-4.4	1.5	0.9	-4.4	-5	99	22	107
01	09 2010 10	VENUS MARS α VIR	4.3	1.0	3.5	4.4	44	-4.4	1.5	0.9	-4.4	16	120	37	137
01	09 2010 12	VENUS MARS α VIR	4.4	1.0	3.5	4.4	44	-4.4	1.5	0.9	-4.4	32	147	44	176
01	09 2010 14	VENUS MARS α VIR	4.4	1.0	3.5	4.4	44	-4.4	1.5	0.9	-4.4	38	181	39	216
01	09 2010 16	VENUS MARS α VIR	4.4	1.1	3.4	4.4	44	-4.4	1.5	0.9	-4.4	30	215	25	247
01	09 2010 18	VENUS MARS α VIR	4.4	1.1	3.4	4.5	44	-4.4	1.5	0.9	-4.4	13	241	7	272
01	09 2010 20	VENUS MARS α VIR	4.4	1.1	3.3	4.5	44	-4.4	1.5	0.9	-4.4	-9	261	-9	297
01	09 2010 22	VENUS MARS α VIR	4.4	1.2	3.3	4.5	44	-4.4	1.5	0.9	-4.4	-31	282	-22	324
02	09 2010 00	VENUS MARS α VIR	4.5	1.2	3.2	4.5	44	-4.4	1.5	0.9	-4.4	-50	311	-28	357
02	09 2010 02	VENUS MARS α VIR	4.5	1.3	3.2	4.5	44	-4.4	1.5	0.9	-4.4	-58	2	-24	30
02	09 2010 04	VENUS MARS α VIR	4.5	1.3	3.2	4.6	44	-4.4	1.5	0.9	-4.4	-48	52	-11	58
02	09 2010 06	VENUS MARS α VIR	4.5	1.4	3.1	4.6	44	-4.4	1.5	0.9	-4.4	-27	80	4	83
02	09 2010 08	VENUS MARS α VIR	4.5	1.4	3.1	4.6	44	-4.4	1.5	0.9	-4.4	-5	100	22	108
02	09 2010 10	VENUS MARS α VIR	4.6	1.5	3.0	4.6	44	-4.4	1.5	0.9	-4.4	16	121	37	138
02	09 2010 12	VENUS MARS α VIR	4.6	1.5	3.0	4.6	44	-4.4	1.5	0.9	-4.4	32	147	44	176
02	09 2010 14	VENUS MARS α VIR	4.6	1.6	3.0	4.6	44	-4.4	1.5	0.9	-4.4	37	181	39	216
02	09 2010 16	VENUS MARS α VIR	4.6	1.6	2.9	4.7	44	-4.4	1.5	0.9	-4.4	30	215	25	247
02	09 2010 18	VENUS MARS α VIR	4.6	1.7	2.9	4.7	44	-4.4	1.5	0.9	-4.4	12	241	7	272
02	09 2010 20	VENUS MARS α VIR	4.6	1.8	2.8	4.7	44	-4.4	1.5	0.9	-4.4	-9	261	-9	297
02	09 2010 22	VENUS MARS α VIR	4.7	1.8	2.8	4.7	43	-4.4	1.5	0.9	-4.4	-31	282	-23	324
03	09 2010 00	VENUS MARS α VIR	4.7	1.9	2.8	4.7	43	-4.4	1.5	0.9	-4.4	-51	311	-29	357
03	09 2010 02	VENUS MARS α VIR	4.7	1.9	2.7	4.7	43	-4.4	1.5	0.9	-4.4	-59	3	-24	30
03	09 2010 04	VENUS MARS α VIR	4.7	2.0	2.7	4.8	43	-4.4	1.5	0.9	-4.4	-48	52	-12	59
03	09 2010 06	VENUS MARS α VIR	4.7	2.1	2.7	4.8	43	-4.4	1.5	0.9	-4.4	-27	80	4	83
03	09 2010 08	VENUS MARS α VIR	4.7	2.1	2.6	4.8	43	-4.4	1.5	0.9	-4.4	-5	100	22	108
03	09 2010 10	VENUS MARS α VIR	4.8	2.2	2.6	4.8	43	-4.4	1.5	0.9	-4.4	16	121	37	138
03	09 2010 12	VENUS MARS α VIR	4.8	2.3	2.6	4.8	43	-4.4	1.5	0.9	-4.4	32	148	43	176
03	09 2010 14	VENUS MARS α VIR	4.8	2.3	2.5	4.8	43	-4.4	1.5	0.9	-4.4	37	182	38	216
03	09 2010 16	VENUS MARS α VIR	4.8	2.4	2.5	4.9	43	-4.4	1.5	0.9	-4.4	29	215	24	247
03	09 2010 18	VENUS MARS α VIR	4.8	2.4	2.5	4.9	43	-4.4	1.5	0.9	-4.4	12	240	7	272
03	09 2010 20	VENUS MARS α VIR	4.8	2.5	2.4	4.9	43	-4.4	1.5	0.9	-4.4	-9	261	-10	296
03	09 2010 22	VENUS MARS α VIR	4.9	2.6	2.4	4.9	43	-4.4	1.5	0.9	-4.4	-32	281	-23	324
04	09 2010 00	VENUS MARS α VIR	4.9	2.6	2.4	4.9	43	-4.4	1.5	0.9	-4.4	-51	311	-29	357
04	09 2010 02	VENUS MARS α VIR	4.9	2.7	2.3	4.9	43	-4.4	1.5	0.9	-4.4	-59	3	-25	30
04	09 2010 04	VENUS MARS α VIR	4.9	2.8	2.3	5.0	43	-4.4	1.5	0.9	-4.4	-48	53	-12	59
04	09 2010 06	VENUS MARS α VIR	4.9	2.8	2.3	5.0	43	-4.4	1.5	0.9	-4.4	-27	81	4	83
04	09 2010 08	VENUS MARS α VIR	4.9	2.9	2.3	5.0	43	-4.4	1.5	0.9	-4.4	-5	101	21	108
04	09 2010 10	VENUS MARS α VIR	5.0	3.0	2.2	5.0	43	-4.4	1.5	0.9	-4.4	16	122	36	138
04	09 2010 12	VENUS MARS α VIR	5.0	3.0	2.2	5.0	43	-4.4	1.5	0.9	-4.4	31	148	43	176
04	09 2010 14	VENUS MARS α VIR	5.0	3.1	2.2	5.0	43	-4.4	1.5	0.9	-4.4	37	182	38	216

DATE	TIME	BODIES		D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
14	11 2010 02	MERCURY MARS	$\alpha$ SCO	4.8	3.4	4.5	5.0	18	-0.4	1.4	0.9	-0.8	-61	62	-47	46
14	11 2010 04	MERCURY MARS	$\alpha$ SCO	4.7	3.3	4.5	5.0	18	-0.4	1.4	0.9	-0.8	-39	89	-31	77
14	11 2010 06	MERCURY MARS	$\alpha$ SCO	4.7	3.2	4.5	5.0	18	-0.4	1.4	0.9	-0.8	-17	107	-13	102
14	11 2010 08	MERCURY MARS	$\alpha$ SCO	4.6	3.2	4.6	4.9	18	-0.4	1.4	0.9	-0.8	3	126	2	125
14	11 2010 10	MERCURY MARS	$\alpha$ SCO	4.5	3.1	4.6	4.9	18	-0.4	1.4	0.9	-0.8	18	150	14	152
14	11 2010 12	MERCURY MARS	$\alpha$ SCO	4.5	3.0	4.6	4.9	18	-0.4	1.4	0.9	-0.8	25	179	18	181
14	11 2010 14	MERCURY MARS	$\alpha$ SCO	4.4	2.9	4.7	4.9	18	-0.4	1.4	0.9	-0.8	20	208	13	210
14	11 2010 16	MERCURY MARS	$\alpha$ SCO	4.4	2.9	4.7	4.9	18	-0.4	1.4	0.9	-0.8	6	232	1	236
14	11 2010 18	MERCURY MARS	$\alpha$ SCO	4.3	2.8	4.7	4.8	18	-0.4	1.4	0.9	-0.8	-13	251	-15	259
14	11 2010 20	MERCURY MARS	$\alpha$ SCO	4.3	2.7	4.8	4.9	18	-0.4	1.4	0.9	-0.8	-35	269	-33	284
14	11 2010 22	MERCURY MARS	$\alpha$ SCO	4.2	2.7	4.8	4.9	18	-0.4	1.4	0.9	-0.8	-57	295	-48	316
15	11 2010 00	MERCURY MARS	$\alpha$ SCO	4.2	2.6	4.8	4.9	18	-0.4	1.4	0.9	-0.8	-71	357	-55	2
15	11 2010 02	MERCURY MARS	$\alpha$ SCO	4.1	2.6	4.9	4.9	18	-0.4	1.4	0.9	-0.8	-61	62	-47	46
15	11 2010 04	MERCURY MARS	$\alpha$ SCO	4.0	2.5	4.9	5.0	18	-0.4	1.4	0.9	-0.8	-40	88	-31	78
15	11 2010 06	MERCURY MARS	$\alpha$ SCO	4.0	2.5	4.9	5.0	18	-0.4	1.4	0.9	-0.8	-18	107	-14	102
15	11 2010 08	MERCURY MARS	$\alpha$ SCO	3.9	2.5	5.0	5.0	18	-0.4	1.4	0.9	-0.8	3	126	2	125

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

Date in the format day/month/year

Dxy = distance between the body x and y, in °

GROUP = least group, in degree

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.



# PIANETI-STELLE IN LINEA RETTA

## PLANETS-STARS IN STRAIGHT LINE

DATE	TIMES	BODIES	C	ALT	AZ	ALT.S.	AZ.S
01	09 2010 23	VENUS MARS $\alpha$ VIR	0.478	-41	294	-26	340
02	09 2010 00	VENUS MARS $\alpha$ VIR	0.448	-50	311	-28	357
02	09 2010 01	VENUS MARS $\alpha$ VIR	0.418	-56	334	-27	14
02	09 2010 02	VENUS MARS $\alpha$ VIR	0.387	-58	2	-24	30
02	09 2010 03	VENUS MARS $\alpha$ VIR	0.357	-55	30	-18	45
02	09 2010 04	VENUS MARS $\alpha$ VIR	0.327	-48	52	-11	58
02	09 2010 05	VENUS MARS $\alpha$ VIR	0.296	-38	67	-3	71
02	09 2010 06	VENUS MARS $\alpha$ VIR	0.266	-27	80	4	83
02	09 2010 07	VENUS MARS $\alpha$ VIR	0.236	-16	90	13	95
02	09 2010 08	VENUS MARS $\alpha$ VIR	0.206	-5	100	22	108
02	09 2010 09	VENUS MARS $\alpha$ VIR	0.177	6	110	30	122
02	09 2010 10	VENUS MARS $\alpha$ VIR	0.147	16	121	37	138
02	09 2010 11	VENUS MARS $\alpha$ VIR	0.118	25	133	42	156
02	09 2010 12	VENUS MARS $\alpha$ VIR	0.088	32	147	44	176
02	09 2010 13	VENUS MARS $\alpha$ VIR	0.059	36	164	43	197
02	09 2010 14	VENUS MARS $\alpha$ VIR	0.029	37	181	39	216
02	09 2010 15	VENUS MARS $\alpha$ VIR	0.000	35	199	32	232
02	09 2010 16	VENUS MARS $\alpha$ VIR	-0.029	30	215	25	247
02	09 2010 17	VENUS MARS $\alpha$ VIR	-0.059	22	229	16	260
02	09 2010 18	VENUS MARS $\alpha$ VIR	-0.089	12	241	7	272
02	09 2010 19	VENUS MARS $\alpha$ VIR	-0.119	2	251	-1	284
02	09 2010 20	VENUS MARS $\alpha$ VIR	-0.150	-9	261	-9	297
02	09 2010 21	VENUS MARS $\alpha$ VIR	-0.181	-20	271	-17	310
02	09 2010 22	VENUS MARS $\alpha$ VIR	-0.212	-31	282	-23	324
02	09 2010 23	VENUS MARS $\alpha$ VIR	-0.244	-42	294	-27	340
03	09 2010 00	VENUS MARS $\alpha$ VIR	-0.275	-51	311	-29	357
03	09 2010 01	VENUS MARS $\alpha$ VIR	-0.307	-57	334	-28	14
03	09 2010 02	VENUS MARS $\alpha$ VIR	-0.339	-59	3	-24	30
03	09 2010 03	VENUS MARS $\alpha$ VIR	-0.371	-55	31	-19	45
03	09 2010 04	VENUS MARS $\alpha$ VIR	-0.403	-48	52	-12	59
03	09 2010 05	VENUS MARS $\alpha$ VIR	-0.435	-38	68	-4	71
03	09 2010 06	VENUS MARS $\alpha$ VIR	-0.467	-27	80	4	83
03	09 2010 07	VENUS MARS $\alpha$ VIR	-0.498	-16	91	13	95

Quanto più il parametro C è prossimo a zero tanto più i corpi sono allineati

Date, Time = data ed ora

Bodies = corpi

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Ore in T.U.

How much anymore the parameter C is next to zero so much the bodies are lined up

Date in the format day/month/year

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# OCCULTAZIONI GEOCENTRICHE PIANETI-STELLE m<9

## GEOCENTRIC OCCULTATIONS PLANETS-STARS m<9

Date			U.T.		Diameter		Durn	Star	Elon	%	Star	Planet	Min.D	R.A. (J2000)			Dec.		
y	m	d	h	m	km	"	sec/m	mag	o	Ill	No.			h	m	s	o	'	"
2010	01	7	0	47.6	4878	9.96	188s	8.5	6	3	TYC 6288-01139-1	Mercury	0.07	18	47	38.871	-19	52	0.40
2010	04	26	21	6.0	12244	11.39	225s	8.5	25	90	TYC 1261-00383-1	Venus	1.36	3	58	36.341	21	8	54.43
2010	05	31	0	20.1	12244	13.06	264s	6.8	33	81	HIP 33419	Venus	1.18	6	56	59.758	24	38	33.80
2010	06	18	2	3.4	12244	14.42	297s	6.9	37	75	HIP 41524	Venus	0.99	8	28	7.157	21	8	53.10
2010	07	10	19	41.3	4878	5.34	67.4s	7.9	14	87	TYC 1390-01444-1	Mercury	0.61	8	18	54.543	21	29	38.74
2010	07	29	20	8.0	5268	1.68	407s	8.6	123		HIP 1127	Ganymede	0.50	0	14	4.082	-0	2	0.23
2010	07	30	9	58.1	3130	0.997	268s	8.6	124		HIP 1127	Europa	0.56	0	14	4.082	-0	2	0.23
2010	09	18	21	13.5	12244	37.02	24.8m	8.7	41	30	TYC 6142-00845-1	Venus	1.05	14	10	40.594	-18	43	54.95
2010	09	25	3	2.8	12244	40.87	36.5m	9.0	38	25	TYC 6147-00204-1	Venus	0.69	14	22	28.364	-20	28	48.45
2010	09	26	19	0.6	12244	41.99	41.7m	8.2	38	23	TYC 6164-00244-1	Venus	0.94	14	24	58.210	-20	52	27.93
2010	10	12	11	37.1	4878	4.84	66.5s	8.2	4	99	HIP 63391	Mercury	0.31	12	59	23.681	-4	54	24.51
2010	10	13	9	22.8	12244	54.63	109m	8.5	24	8	HIP 70964	Venus	0.16	14	30	53.991	-22	33	36.77
2010	10	17	15	50.7	12244	57.62	62.6m	8.1	19	5	HIP 70552	Venus	1.01	14	25	55.818	-22	7	36.91
2010	11	4	19	1.7	4878	4.82	75.6s	8.5	11	95	TYC 6179-01291-1s	Mercury	0.95	15	23	11.433	-19	47	16.33
2010	11	17	9	46.0	4878	5.29	88.8s	6.1	17	87	HIP 81728	Mercury	0.04	16	41	36.135	-24	28	4.77
2010	11	18	23	43.3	4878	5.38	91.6s	7.7	18	85	HIP 82474	Mercury	0.24	16	51	21.568	-24	50	3.12
2010	12	7	11	14.0	4878	7.65	367s	8.8	20	43	TYC 6848-03363-1	Mercury	0.59	18	22	13.900	-24	54	20.40
2010	12	15	18	50.1	12244	34.10	17.9m	8.4	44	35	HIP 71005	Venus	1.66	14	31	18.536	-11	52	12.80
2010	12	17	10	38.4	4878	9.75	185s	9.0	6	3	TYC 6263-01758-1	Mercury	0.92	18	5	50.997	-22	12	16.08
2010	12	20	23	33.7	12244	31.67	906s	6.3	46	39	HIP 72373	Venus	0.75	14	47	54.988	-12	50	25.04
2010	12	29	4	15.1	12244	28.42	731s	8.7	47	44	HIP 74783	Venus	0.69	15	16	59.552	-14	35	53.91

Date = data nel formato anno/mese/giorno  
 U.T. = ora dell'evento  
 Diameter = diametro in km ed in " del pianeta  
 Durn = durata dell'evento, in minuti o secondi  
 Star mag = magnitudine della stella coinvolta  
 Elon = elongazione, in gradi  
 % ill = percentuale illuminata del pianeta  
 Star = stella coinvolta  
 Planet = pianeta  
 Min.D. = distanza del centro dell'occultazione dal centro della Terra  
 Dist = distanza del percorso  
 Alt = altezza sull'orizzonte del pianeta, in gradi  
 Sole alt = altezza sull'orizzonte del Sole, in gradi

Date = date in the format year/month/day  
 U.T. = times  
 Diameter = diameter in km and in " of the planet  
 Durn = duration of the event, in minutes or seconds  
 Stella Mag = magnitude of the star  
 Elon = elongation, in degree  
 % ill = illumination of the planet  
 Alt = height on the horizon of the planet, in °  
 Sun alt = height on the horizon of the Sun, in °

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# OCCULTAZIONI TOPOCENTRICHE PIANETI-STELLE $m < 9$

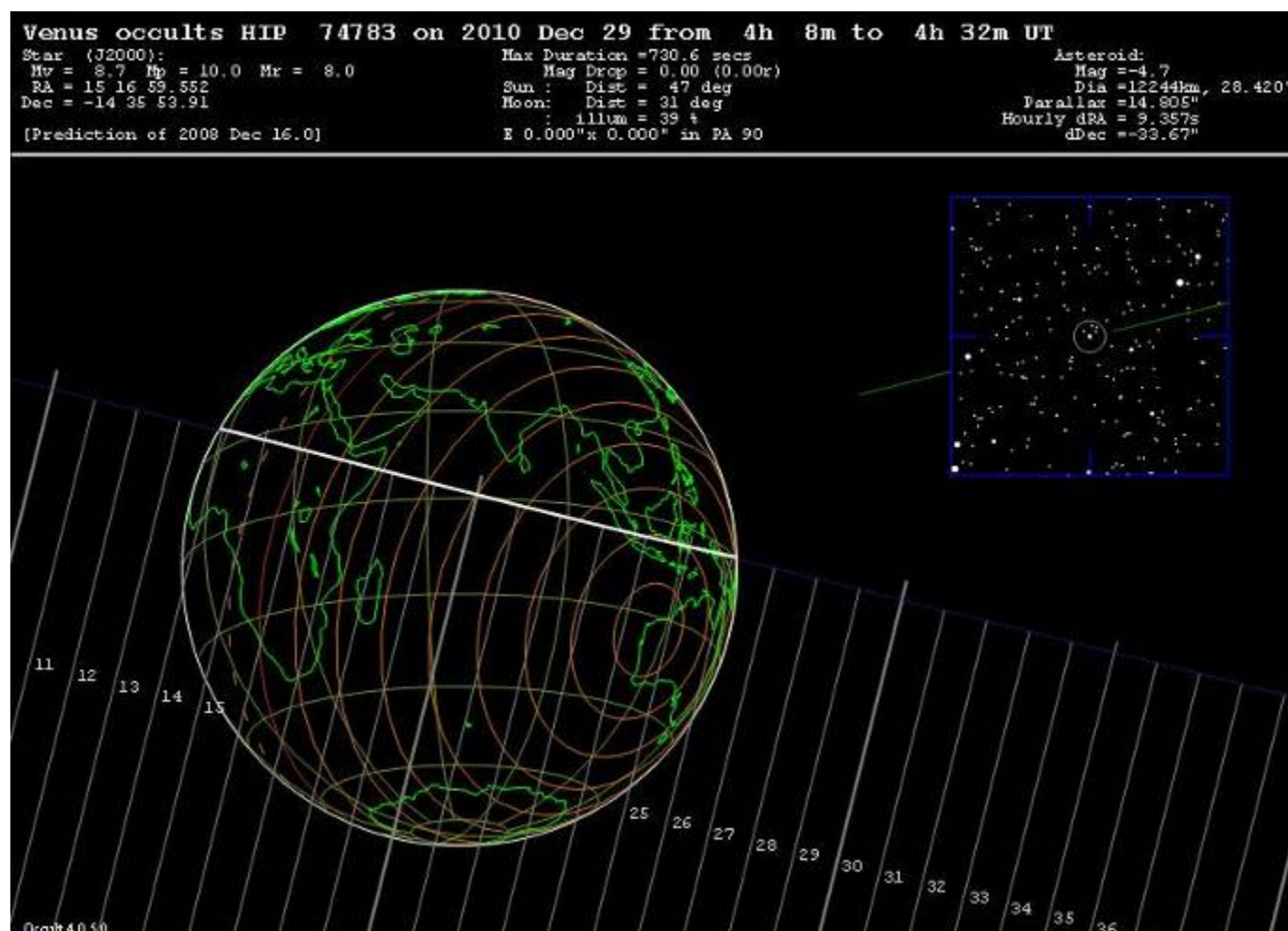
## TOPOCENTRIC OCCULTATIONS PLANETS-STARS $m < 9$

Date			U.T.		Diameter		Durn	Star	Elon	%	Star	Planet	Alt	Dist	Sun	Proba-	Moon	R.A. (J2000)			Dec.			
y	m	d	h	m	km	"	sec/m	mag	o	Ill	No.		o	km	Alt	bility	ill	Elon	h	m	s	o	'	"
2010	12	29	4	15.1	12244	28.42	731s	8.7	47	44	HIP 74783	Venus	14	11121		96%	39	31	15	16	59.552	-14	35	53.91

Date = data nel formato anno/mese/giorno  
 U.T. = ora dell'evento  
 Diameter = diametro in km ed in " del pianeta  
 Durn = durata dell'evento, in minuti o secondi  
 Star mag = magnitudine della stella coinvolta  
 Elon = elongazione, in gradi  
 % ill = percentuale illuminata del pianeta  
 Star = stella coinvolta  
 Planet = pianeta  
 Alt = altezza sull'orizzonte del pianeta, in gradi  
 Dist. = distanza del centro dell'occultazione dal centro della Terra  
 Sun alt = altezza sull'orizzonte del Sole, in gradi  
 Probabilità = probabilità che l'evento accada  
 Moon ill = percentuale di Luna illuminata  
 Moon elon = elongazione lunare

Date = date in the format year/month/day  
 U.T. = times  
 Diameter = diameter in km and in " of the planet  
 Durn = duration of the event, in minutes or seconds  
 Star mag = magnitude of the star  
 Elon = elongation, in degree  
 % ill = illumination of the planet  
 Alt = height on the horizon of the planet, in °  
 Sun alt = height on the horizon of the Sun, in °

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# CONGIUNZIONI <1° PIANETI - OGGETTI MESSIER m<9

## CONJUNCTIONS <1° PLANETS - OBJECTS MESSIER m<9

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)	tw(h)		
2010/01/01	11:41:22	0.27272	0.00279	1.708	178	-3	-3.9	5.1		18.3	Venus	NGC6656 M22
2010/01/10	12:57:35	0.65181	0.00479	0.705	357	-13	0.8	4.6		22.3	Mercury	M25
2010/01/17	22:53:50	0.59229	0.00278	1.711	169	2	-3.9	8.5		15.4	Venus	NGC6864 M75
2010/02/09	19:52:25	0.72468	0.00280	1.204	173	-22	-0.1	8.5		11.8	Mercury	NGC6864 M75
2010/04/17	08:42:00	0.85489	0.00322	1.162	200	100	0.4	3.7		36.9	Mars	NGC2632 M44
2010/05/21	20:17:28	0.69778	0.00353	1.349	179	32	-3.8	5.3		14.4	Venus	NGC2168 M35
2010/06/20	16:12:21	0.41321	0.00413	1.153	195	38	-3.9	3.7		18.8	Venus	NGC2632 M44
2010/06/26	10:24:49	0.03424	0.00256	1.319	177	-3	-1.9	5.3		11.0	Mercury	NGC2168 M35
2010/07/13	14:38:12	0.16597	0.00275	1.228	197	16	-0.6	3.7		13.1	Mercury	NGC2632 M44
2010/11/13	09:44:20	0.34159	0.00256	1.320	13	16	-0.5	7.3		15.4	Mercury	NGC6093 M80
2010/12/08	12:03:28	0.21701	0.00395	0.854	145	19	-0.1	6.8		61.3	Mercury	NGC6626 M28
2010/12/09	07:23:00	0.07357	0.00158	2.371	180	14	1.2	6.0		31.6	Mars	NGC6523 M8
2010/12/15	12:49:52	0.64431	0.00157	2.375	178	12	1.2	6.8		24.1	Mars	NGC6626 M28
2010/12/17	20:58:34	0.93723	0.00492	0.686	194	5	2.4	9.0		6.4	Mercury	NGC6514 M20
2010/12/17	14:31:56	0.36179	0.00490	0.688	194	6	2.1	6.5		17.5	Mercury	NGC6531 M21
2010/12/19	02:59:43	0.19890	0.00157	2.376	357	11	1.1	5.1		30.8	Mars	NGC6656 M22

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. del pianeta dalla Terra

p = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del pianeta

m\* = magnitudine dell'oggetto

tm = se presente, l'oggetto viene occultato massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di 1° tra loro

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

R1 = distance in A.U. of the planet from the Earth

p = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the planet

m\* = magnitude of the object

tm = if present, the object is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than 1°

## CONGIUNZIONI MULTIPLE PIANETI-OGGETTI

(eventi con 2 o più pianeti ed un oggetto Messier entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS-OBJECTS

(events with 2 or more planets and a Messier object within 5°)

Date	TT	Dmed	Dmax	emin	m2d	mmax				
2010/12/13	18:51:54	3.114	4.055	13	1.2	6.0	Mars	NGC6523	M8	Mercury
2010/12/14	02:06:28	3.185	3.850	13	1.2	5.1	Mercury	NGC6656	M22	Mars

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dmed = middle distance between the center of the planets, in gradi

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest planet

mmax = least magnitude

# CONGIUNZIONI MULTIPLE MISTE

## CERCHI MINIMI PIANETI - OGGETTI

(eventi con 2 o più pianeti ed un oggetto Messier entro 5°)

## LEAST GROUPING PLANETS - OBJECTS

(events with 2 or more planets and a Messier object within 5°)

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
------	------	--------	-----	-----	-----	-------	-----	------	------	------	------	-----	----	--------	-------

Questo anno non avvengono fenomeni - No phenomena this year

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Ore in T.U.

Date in the format day/month/year

Dxy = distance between the body x and y, in °

GROUP = least group, in degree

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# EFFEMERIDI DELLA LUNA - EPHEMERIDES OF THE MOON

Date	A.R. Geoc.	Dec. Geoc.	A.R. Top.	Dec. Top.	Dist. km	EI °	Diam. "	Mag	Phase	Phase. angle°	Par.	L1	L2	L3	L4	L5	L6
01/01/2010	06h 55m 10.57s	+23° 37' 01.1"	06h 55m 30.91s	+23° 17' 42.3"	359434	177.7	1995	-12.7	1.000	2.3	3660	-1.9	-1.0	-1.9	-0.9	-2.0	-0.6
02/01/2010	07h 58m 33.33s	+20° 01' 27.7"	07h 59m 42.69s	+19° 37' 32.2"	358691	163.7	1999	-12.3	0.980	16.2	3668	0.0	0.8	0.0	0.9	-0.1	1.3
03/01/2010	08h 58m 30.61s	+15° 06' 28.6"	09h 00m 18.90s	+14° 36' 43.0"	359778	149.7	1993	-11.9	0.932	30.3	3657	1.8	2.6	1.8	2.6	1.6	3.1
04/01/2010	09h 54m 50.59s	+09° 19' 50.5"	09h 57m 07.15s	+08° 44' 43.4"	362492	135.8	1978	-11.6	0.859	44.1	3629	3.5	4.1	3.5	4.1	3.1	4.7
05/01/2010	10h 48m 14.71s	+00° 09' 01.7"	10h 50m 46.65s	+02° 30' 17.7"	366475	122.2	1956	-11.2	0.767	57.7	3590	4.9	5.4	4.9	5.4	4.4	6.0
06/01/2010	11h 39m 31.93s	-03° 02' 10.8"	11h 42m 20.29s	-03° 42' 10.8"	371291	108.9	1931	-10.8	0.663	70.9	3543	6.0	6.2	6.0	6.3	5.4	6.9
07/01/2010	12h 29m 59.87s	-08° 54' 22.9"	12h 32m 54.83s	-09° 33' 16.9"	376502	96.1	1904	-10.4	0.554	83.8	3494	6.8	6.7	6.8	6.7	6.1	7.4
08/01/2010	13h 20m 33.57s	-14° 11' 48.7"	13h 23m 29.33s	-14° 47' 37.5"	381728	83.6	1878	-9.9	0.446	96.2	3447	7.1	6.8	7.1	6.8	6.4	7.5
09/01/2010	14h 11m 57.52s	-18° 41' 17.6"	14h 14m 47.50s	-19° 12' 40.8"	386682	71.5	1854	-9.4	0.343	108.3	3402	7.1	6.6	7.1	6.6	6.4	7.1
10/01/2010	15h 04m 34.76s	-22° 11' 38.0"	15h 07m 11.24s	-22° 38' 02.8"	391174	59.8	1833	-8.8	0.249	120.1	3363	6.8	6.0	6.8	6.0	6.1	6.5
11/01/2010	15h 58m 21.09s	-24° 33' 48.9"	16h 00m 35.72s	-24° 55' 33.8"	395103	48.2	1815	-8.1	0.168	131.7	3330	6.2	5.1	6.2	5.1	5.6	5.5
12/01/2010	16h 52m 44.30s	-25° 41' 55.8"	16h 54m 29.35s	-26° 00' 07.2"	398437	36.9	1799	-7.3	0.100	143.0	3302	5.4	4.0	5.4	4.0	4.9	4.4
13/01/2010	17h 46m 51.74s	-25° 34' 20.0"	17h 48m 01.84s	-25° 50' 38.5"	401182	25.7	1787	-6.5	0.050	154.2	3279	4.4	2.7	4.4	2.7	3.9	3.1
14/01/2010	18h 39m 46.31s	-24° 14' 11.2"	18h 40m 19.42s	-24° 30' 31.1"	403358	14.6	1777	-5.4	0.016	165.3	3262	3.2	1.4	3.2	1.4	2.9	1.7
15/01/2010	19h 30m 43.62s	-21° 48' 55.7"	19h 30m 40.98s	-22° 07' 02.4"	404975	3.7	1770	-4.3	0.001	176.3	3249	1.9	0.0	1.9	0.0	1.7	0.3
16/01/2010	20h 19m 22.75s	-18° 28' 49.1"	20h 18m 47.70s	-18° 50' 02.7"	406015	7.2	1766	-4.7	0.004	172.8	3240	0.5	-1.5	0.5	-1.4	0.5	-1.1
17/01/2010	21h 05m 47.67s	-14° 25' 16.4"	21h 04m 44.32s	-14° 50' 23.4"	406430	18.0	1764	-5.8	0.025	161.9	3237	-0.9	-2.8	-0.9	-2.8	-1.0	-2.4
18/01/2010	21h 50m 22.52s	-09° 49' 35.1"	21h 48m 54.78s	-10° 18' 47.4"	406142	28.8	1765	-6.7	0.062	151.1	3239	-2.3	-4.0	-2.3	-4.0	-2.5	-3.5
19/01/2010	22h 33m 45.38s	-04° 52' 16.7"	22h 31m 56.44s	-05° 25' 15.2"	405053	39.7	1770	-7.5	0.116	140.2	3248	-3.6	-5.1	-3.7	-5.1	-4.0	-4.5
20/01/2010	23h 16m 43.45s	+00° 16' 54.2"	23h 14m 35.73s	+00° 19' 05.1"	403068	50.5	1779	-8.2	0.183	129.3	3264	-4.9	-5.9	-4.9	-5.9	-5.3	-5.3
21/01/2010	00h 00m 10.12s	+05° 28' 32.9"	23h 57m 45.51s	+04° 50' 40.0"	400115	61.6	1792	-8.9	0.263	118.3	3288	-6.0	-6.5	-6.0	-6.5	-6.5	-5.8
22/01/2010	00h 45m 03.29s	+10° 32' 46.7"	00h 42m 23.69s	+09° 54' 24.2"	396173	72.8	1810	-9.4	0.353	107.1	3321	-6.9	-6.8	-6.9	-6.8	-7.4	-8.1
23/01/2010	01h 32m 23.16s	+15° 18' 10.9"	01h 29m 31.29s	+14° 40' 54.2"	391299	84.2	1832	-9.9	0.451	95.6	3362	-7.5	-6.8	-7.5	-6.8	-8.1	-6.1
24/01/2010	02h 23m 06.94s	+19° 30' 43.0"	02h 20m 07.54s	+18° 56' 08.3"	385647	96.0	1859	-10.4	0.554	83.9	3412	-7.7	-6.4	-7.7	-6.4	-8.4	-5.8
25/01/2010	03h 17m 57.37s	+22° 53' 00.2"	03h 14m 58.57s	+22° 22' 26.5"	379489	108.2	1889	-10.8	0.657	71.7	3467	-7.6	-5.7	-7.6	-5.7	-8.3	-5.1
26/01/2010	04h 17m 03.95s	+25° 04' 56.9"	04h 14m 17.98s	+24° 38' 58.4"	373208	120.8	1921	-11.1	0.757	59.0	3525	-7.1	-4.7	-7.1	-4.7	-7.8	-4.2
27/01/2010	05h 19m 42.58s	+25° 46' 47.0"	05h 17m 24.74s	+25° 24' 43.1"	367285	134.0	1952	-11.5	0.848	45.9	3582	-6.1	-3.4	-6.1	-3.3	-6.8	-2.9
28/01/2010	06h 24m 13.01s	+24° 44' 42.1"	06h 22m 36.76s	+24° 24' 26.8"	362250	147.6	1979	-11.9	0.922	32.4	3632	-4.7	-1.7	-4.8	-1.7	-5.3	-1.3
29/01/2010	07h 28m 25.49s	+21° 56' 43.6"	07h 27m 38.97s	+21° 35' 16.5"	358613	161.5	1999	-12.2	0.974	18.4	3669	-3.0	0.0	-3.0	0.0	-3.4	0.4
30/01/2010	08h 30m 31.98s	+17° 35' 00.6"	08h 30m 35.54s	+17° 09' 31.8"	356772	175.5	2010	-12.6	0.998	4.5	3688	-1.0	1.8	-1.1	1.8	-1.2	2.3
31/01/2010	09h 29m 39.57s	+12° 02' 54.2"	09h 30m 28.21s	+11° 31' 46.6"	356934	169.7	2009	-12.5	0.992	10.2	3686	1.0	3.5	1.0	3.5	1.0	4.0
01/02/2010	10h 25m 52.05s	+05° 49' 06.1"	10h 27m 18.77s	+05° 12' 21.6"	359069	155.6	1997	-12.1	0.956	24.3	3664	3.0	4.9	3.0	4.9	2.8	5.5
02/02/2010	11h 19m 50.29s	-00° 37' 48.2"	11h 21m 48.31s	-01° 18' 41.9"	362919	141.7	1976	-11.7	0.893	38.2	3625	4.8	5.9	4.8	6.0	4.4	6.6
03/02/2010	12h 12m 30.46s	-06° 52' 37.7"	12h 14m 53.77s	-07° 35' 23.1"	368053	128.2	1948	-11.4	0.810	51.7	3575	6.2	6.6	6.2	6.6	5.7	7.3
04/02/2010	13h 04m 48.08s	-12° 34' 46.8"	13h 07m 30.95s	-13° 16' 55.1"	373960	115.1	1917	-11	0.714	64.7	3518	7.2	6.8	7.2	6.8	6.6	7.5
05/02/2010	13h 57m 27.28s	-17° 28' 05.5"	14h 00m 23.44s	-18° 07' 27.4"	380126	102.6	1886	-10.6	0.610	77.3	3461	7.7	6.6	7.7	6.6	7.0	7.3
06/02/2010	14h 50m 53.03s	-21° 20' 14.9"	14h 53m 54.88s	-21° 55' 20.4"	386105	90.4	1857	-10.1	0.505	89.4	3407	7.8	6.1	7.8	6.1	7.1	6.7
07/02/2010	15h 45m 05.72s	-24° 02' 26.6"	15h 48m 04.24s	-24° 32' 36.8"	391552	78.6	1831	-9.7	0.403	101.2	3360	7.4	5.3	7.4	5.3	6.7	5.8
08/02/2010	16h 39m 40.49s	-25° 29' 31.9"	16h 42m 26.01s	-25° 55' 01.1"	396238	67.2	1809	-9.2	0.307	112.7	3320	6.7	4.2	6.7	4.2	6.0	4.7
09/02/2010	17h 33m 53.80s	-25° 40' 25.7"	17h 36m 17.46s	-26° 02' 15.2"	400041	56.0	1792	-8.6	0.221	123.9	3289	5.7	3.0	5.7	3.0	5.0	3.4
10/02/2010	18h 26m 56.67s	-24° 38' 13.6"	18h 28m 51.96s	-24° 57' 57.4"	402926	45.0	1779	-7.9	0.147	134.9	3265	4.5	1.6	4.5	1.6	3.9	2.0
11/02/2010	19h 18m 09.53s	-22° 29' 40.5"	19h 19m 33.00s	-22° 49' 05.1"	404924	34.1	1771	-7.1	0.086	145.8	3249	3.1	0.3	3.1	0.3	2.7	0.6
12/02/2010	20h 07m 12.07s	-19° 24' 03.5"	20h 08m 03.09s	-19° 44' 49.9"	406101	23.3	1765	-6.3	0.041	156.6	3240	1.7	-1.1	1.7	-1.1	1.4	-0.8
13/02/2010	20h 54m 05.62s	-15° 31' 57.5"	20h 54m 25.33s	-15° 55' 26.8"	406534	12.7	1764	-5.2	0.012	167.3	3236	0.3	-2.5	0.3	-2.5	0.1	-2.1
14/02/2010	21h 39m 09.78s	-11° 04' 16.4"	21h 39m 00.11s	-11° 31' 21.6"	406293	3.3	1765	-4.2	0.001	176.7	3238	-1.1	-3.7	-1.1	-3.7	-1.2	-3.2
15/02/2010	22h 22m 57.22s	-06° 11' 38.7"	22h 22m 20.09s	-06° 42' 43.7"	405421	9.8	1768	-5	0.007	170.2	3245	-2.4	-4.8	-2.4	-4.8	-2.4	-4.3
16/02/2010	23h 06m 09.12s	-01° 04' 24.5"	23h 05m 06.02s	-01° 39' 22.0"	403931	20.5	1775	-6	0.032	159.5	3257	-3.6	-5.7	-3.6	-5.7	-3.7	-5.1
17/02/2010	23h 49m 32.20s	+04° 07' 16.5"	23h 48m 04.06s	+03° 29' 01.5"	401808	31.4	1784	-6.9	0.074	148.5	3274	-4.7	-6.3	-4.7	-6.3	-5.0	-5.6
18/02/2010	00h 33m 56.76s	+09° 12' 57.0"	00h 32m 04.15s	+08° 32' 24.5"	399022	42.5	1797	-7.7	0.132	137.4	3297	-5.7	-6.6	-5.7	-6.6	-6.0	-5.9
19/02/2010	01h 20m 14.68s	+14° 01' 16.4"	01h 17m 58.23s	+13° 19' 46.8"	395545	53.8	1813	-8.4	0.205	126.1	3326	-6.5	-6.7	-6.5	-6.7	-6.9	-6.0
20/02/2010	02h 09m 15.53s	+18° 19' 20.5"	02h 06m 36.83s	+17° 38' 28.5"	391377	65.3	1832	-9.1	0.292	114.6	3362	-7.0	-6.4	-7.0	-6.4	-7.6	-5.7
21/02/2010	03h 01m 39.05s	+21° 52' 13.9"	02h 58m 41.85s	+21° 13' 36.9"	386576	77.0	1855	-9.6	0.389	102.8	3403	-7.3	-5.8	-7.3	-5.8	-8.0	-5.1
22/02/2010	03h 57m 42.49s	+24° 23' 13.1"	03h 54m 34.17s	+23° 48' 12.5"	381278	89.1	1880	-10.1	0.494	90.7	3451	-7.3	-4.9	-7.4	-4.9	-8.0	-4.2
23/02/2010	04h 57m 06.11s	+25° 35' 22.7"	04h 53m 58.25s	+25° 04' 37.5"	375720	101.6	1908	-10.5	0.602	78.3	3502	-7.0	-3.7	-7.0	-3.7	-7.7	-3.1
24/02/2010	05h 58m 46.06s	+25° 14' 54.5"	05h 55m 53.22s	+24° 47' 55.9"	370240	114.5	1936	-10.9	0.708	65.4	3554	-6.3	-2.3	-6.3	-2.2	-7.0	-1.7
25/02/2010	07h 01m 06.86s	+23° 15' 21.2"	06h 58m 43.10s	+22° 50' 24.7"	365263	127.8	1963	-11.3	0.807	52.1	3602	-5.2	-0.6	-5.2	-0.6	-5.9	-0.1
26/02/2010	08h 02m 33.25s	+19° 40' 40.9"	08h 00m 48.55s	+19° 15' 10.5"	361258	141.4	1985	-11.7	0.891	38.5	3642	-3.7	1.1	-3.8	1.1	-4.3	1.6
27/02/2010	08h 52m 02.59s	+14° 45' 26.6"	09h 01m 01.43s	+14° 16' 44.5"	358668	155.3	1999	-12.1	0.955	24.6	3668	-2.0	2.8	-2.0	2.8	-2.4	3.3
28/02/2010	09h 59m 18.05s	+08° 52' 10.8"	09h 59m 00.59s	+08° 18' 29.2"	357831	169.1	2004	-12.4	0.991	10.9	3677	0.0	4.3	0.0	4.3	-0.3	4.

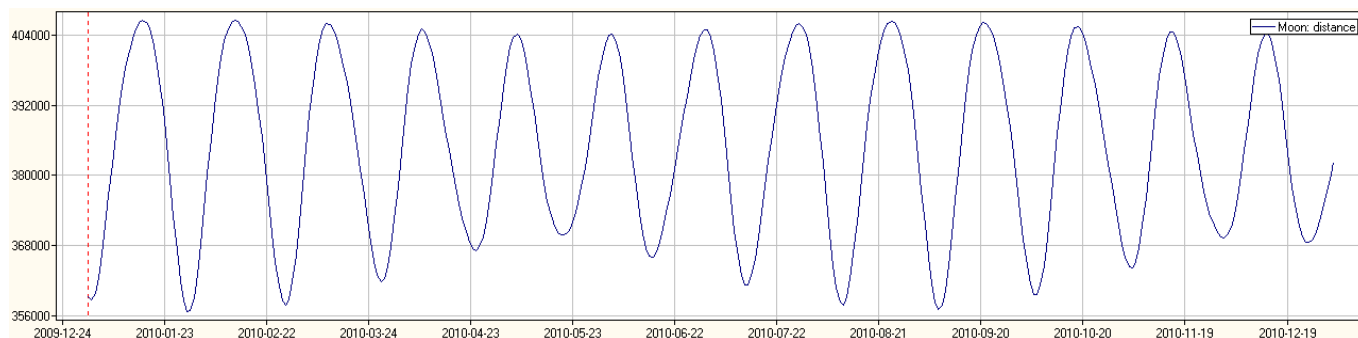
Date	A.R. Geoc.	Dec. Geoc.	A.R. Top.	Dec. Top.	Dist. km	El *	Diam. "	Mag	Phase	Phase. angle°	Par.	L1	L2	L3	L4	L5	L6
09/04/2010	21h 13m 51.15s	-13° 22' 15.2"	21h 16m 08.04s	-13° 51' 43.9"	404987	62.2	1770	-8.9	0.268	117.6	3249	0.8	-3.4	0.8	-3.4	0.1	-2.8
10/04/2010	21h 58m 19.58s	-08° 46' 44.7"	22h 00m 16.26s	-09° 17' 42.5"	404601	51.4	1772	-8.3	0.189	128.4	3252	-0.6	-4.5	-0.6	-4.5	-1.2	-3.9
11/04/2010	22h 41m 58.10s	-03° 50' 25.2"	22h 43m 32.92s	-04° 23' 54.6"	403183	40.6	1778	-7.6	0.121	139.3	3263	-1.8	-5.4	-1.8	-5.4	-2.4	-4.8
12/04/2010	23h 25m 35.80s	-01° 17' 23.1"	23h 26m 46.96s	+00° 40' 38.1"	400928	29.7	1788	-6.8	0.066	150.3	3281	-2.9	-6.0	-2.9	-6.0	-3.4	-5.4
13/04/2010	00h 10m 03.43s	+06° 26' 35.9"	00h 10m 48.55s	+05° 46' 13.9"	398054	18.7	1801	-5.8	0.026	161.3	3305	-3.8	-6.4	-3.8	-6.4	-4.1	-5.8
14/04/2010	00h 56m 11.24s	+11° 25' 40.8"	00h 56m 27.17s	+10° 41' 47.0"	394785	8.2	1816	-4.8	0.005	171.7	3333	-4.4	-6.5	-4.4	-6.5	-4.7	-5.8
15/04/2010	01h 44m 45.16s	+16° 01' 06.2"	01h 44m 28.17s	+15° 14' 16.3"	391324	7.1	1832	-4.7	0.004	172.9	3362	-4.9	-6.3	-4.9	-6.3	-5.0	-5.5
16/04/2010	02h 36m 19.79s	+19° 57' 17.9"	02h 35m 26.25s	+19° 08' 38.5"	387833	17.6	1849	-5.7	0.024	162.3	3392	-5.1	-5.8	-5.1	-5.8	-5.1	-5.0
17/04/2010	03h 31m 07.62s	+22° 57' 25.7"	03h 29m 35.47s	+22° 08' 28.6"	384431	29.5	1865	-6.8	0.065	150.5	3422	-5.1	-4.9	-5.1	-4.9	-5.3	-4.1
18/04/2010	04h 28m 47.49s	+24° 45' 19.3"	04h 26m 38.18s	+23° 57' 46.1"	381185	41.6	1881	-7.7	0.127	138.3	3451	-5.0	-3.8	-5.0	-3.8	-5.4	-3.0
19/04/2010	05h 28m 20.50s	+25° 08' 29.1"	05h 25m 40.33s	+24° 23' 46.0"	378134	54.1	1896	-8.4	0.207	125.8	3479	-4.7	-2.4	-4.8	-2.4	-5.2	-1.6
20/04/2010	06h 28m 21.98s	+24° 01' 11.2"	06h 25m 21.70s	+23° 20' 01.3"	375303	66.7	1910	-9.1	0.303	113.2	3506	-4.3	-0.9	-4.3	-0.9	-4.9	-0.2
21/04/2010	07h 27m 28.59s	+21° 26' 01.4"	07h 24m 20.90s	+20° 48' 09.6"	372729	92.5	1924	-9.7	0.410	100.3	3530	-3.7	0.7	-3.7	0.7	-4.4	1.4
22/04/2010	08h 24m 45.21s	+17° 33' 10.7"	08h 21m 41.87s	+16° 57' 27.8"	370487	99.5	1935	-10.2	0.523	87.3	3551	-2.9	2.2	-2.9	2.2	-3.6	2.9
23/04/2010	09h 19m 56.94s	+12° 38' 06.4"	09h 17m 07.10s	+12° 02' 50.1"	368697	105.7	1945	-10.7	0.637	74.1	3568	-1.9	3.7	-2.0	3.7	-2.7	4.3
24/04/2010	10h 13m 24.48s	+06° 59' 12.6"	10h 10m 54.72s	+06° 22' 34.4"	367521	119.0	1951	-11.1	0.743	60.9	3580	-0.8	4.9	-0.8	4.9	-1.5	5.6
25/04/2010	11h 05m 51.54s	+00° 56' 22.4"	11h 03m 46.85s	+00° 16' 52.2"	367144	132.4	1953	-11.5	0.838	47.5	3583	0.5	5.9	0.5	5.9	-0.2	6.5
26/04/2010	11h 58m 11.72s	-05° 09' 39.9"	11h 56m 36.57s	-05° 52' 55.1"	367731	145.7	1950	-11.8	0.913	34.2	3578	1.8	6.4	1.8	6.4	1.2	7.1
27/04/2010	12h 51m 16.88s	-10° 57' 47.9"	12h 50m 15.88s	-11° 44' 47.9"	369391	158.9	1941	-12.2	0.967	21.1	3562	3.1	6.6	3.0	6.6	2.6	7.4
28/04/2010	13h 45m 46.04s	-16° 06' 51.4"	13h 45m 23.84s	-16° 57' 00.2"	372133	171.3	1927	-12.5	0.994	8.7	3535	4.2	6.3	4.1	6.3	3.9	7.1
29/04/2010	14h 41m 53.91s	-20° 17' 52.3"	14h 42m 14.11s	-21° 09' 36.8"	367521	172.8	1908	-12.5	0.996	7.2	3500	5.0	5.7	5.0	5.7	4.9	6.5
30/04/2010	15h 39m 21.65s	-23° 15' 24.1"	15h 40m 25.09s	-24° 06' 53.3"	380316	161.2	1885	-12.2	0.973	18.8	3459	5.5	4.7	5.5	4.7	5.4	5.6
01/05/2010	16h 37m 16.43s	-24° 50' 16.6"	16h 38m 59.60s	-25° 39' 43.2"	385214	149.1	1861	-11.9	0.929	30.8	3415	5.6	3.5	5.6	3.5	5.3	4.4
02/05/2010	17h 34m 24.96s	-25° 00' 56.8"	17h 36m 40.02s	-25° 47' 04.3"	390172	137.2	1838	-11.6	0.868	42.7	3372	5.3	2.2	5.3	2.2	4.9	3.0
03/05/2010	18h 29m 37.36s	-23° 53' 03.2"	18h 32m 13.94s	-24° 35' 20.5"	394812	125.7	1816	-11.3	0.792	54.2	3332	4.7	0.8	4.6	0.8	4.1	1.5
04/05/2010	19h 22m 08.38s	-21° 37' 10.3"	19h 24m 56.16s	-22° 15' 51.3"	398782	114.4	1798	-10.9	0.707	65.5	3299	3.7	-0.6	3.7	-0.6	3.1	0.1
05/05/2010	20h 11m 45.76s	-18° 25' 54.4"	20h 14m 36.20s	-19° 01' 46.0"	401796	103.3	1784	-10.6	0.616	76.6	3274	2.5	-2.0	2.5	-2.0	1.9	-1.4
06/05/2010	20h 58m 46.06s	-14° 31' 37.1"	21h 01m 32.98s	-15° 05' 44.6"	403649	92.4	1776	-10.2	0.522	87.5	3259	1.2	-3.3	1.2	-3.3	0.5	-2.7
07/05/2010	21h 43m 45.41s	-10° 05' 19.7"	21h 46m 24.57s	-10° 38' 54.7"	404234	81.5	1774	-9.8	0.428	98.3	3255	-0.2	-4.4	-0.2	-4.4	-0.9	-3.8
08/05/2010	22h 27m 30.99s	-05° 16' 39.7"	22h 29m 59.31s	-05° 50' 52.7"	403542	70.7	1777	-9.3	0.336	109.2	3260	-1.5	-5.3	-1.5	-5.3	-2.2	-4.7
09/05/2010	23h 10m 55.59s	-00° 14' 27.3"	23h 13m 10.37s	-00° 50' 22.3"	401663	58.7	1785	-8.8	0.249	120.1	3275	-2.6	-6.0	-2.7	-6.0	-3.3	-5.4
10/05/2010	23h 54m 54.64s	+04° 52' 18.6"	23h 56m 52.90s	+04° 13' 48.0"	398773	48.6	1798	-8.1	0.170	131.3	3299	-3.6	-6.5	-3.7	-6.5	-4.2	-5.8
11/05/2010	00h 40m 24.19s	+09° 53' 27.3"	00h 42m 02.06s	+09° 11' 42.8"	395117	37.3	1815	-7.4	0.103	142.6	3330	-4.4	-6.6	-4.4	-6.6	-4.9	-6.0
12/05/2010	01h 28m 17.81s	+14° 36' 38.4"	01h 29m 30.16s	+13° 51' 23.8"	390990	25.8	1834	-6.5	0.050	154.2	3365	-4.8	-6.5	-4.8	-6.5	-5.3	-5.7
13/05/2010	02h 19m 20.00s	+18° 46' 46.3"	02h 20m 00.50s	+17° 58' 15.1"	386706	14.1	1854	-5.4	0.015	165.9	3402	-5.0	-6.0	-5.1	-6.0	-5.4	-5.2
14/05/2010	03h 13m 54.74s	+22° 06' 16.4"	03h 13m 56.69s	+21° 15' 18.4"	382562	4.1	1874	-4.3	0.001	175.9	3439	-5.0	-5.2	-5.0	-5.2	-5.1	-4.3
15/05/2010	04h 11m 50.56s	+24° 16' 51.8"	04h 11m 08.89s	+23° 24' 51.7"	378814	11.9	1893	-5.2	0.011	168.1	3473	-4.6	-4.0	-4.7	-4.0	-4.7	-3.2
16/05/2010	05h 12m 10.69s	+25° 03' 02.2"	05h 10m 44.57s	+24° 11' 45.3"	375646	24.3	1909	-6.3	0.044	155.7	3502	-4.1	-2.7	-4.2	-2.7	-4.3	-1.8
17/05/2010	06h 13m 20.94s	+24° 16' 20.2"	06h 11m 15.41s	+23° 27' 22.9"	373161	37.1	1921	-7.3	0.102	142.8	3526	-3.5	-1.1	-3.5	-1.1	-3.8	-0.2
18/05/2010	07h 13m 39.46s	+21° 58' 07.0"	07h 11m 04.42s	+21° 12' 26.4"	371382	50.1	1930	-8.2	0.180	129.8	3543	-2.7	0.5	-2.7	0.5	-3.2	1.3
19/05/2010	08h 11m 51.98s	+18° 19' 04.8"	08h 08m 59.20s	+17° 36' 43.2"	370275	63.2	1936	-8.9	0.276	116.6	3553	-1.8	2.1	-1.8	2.1	-2.4	2.9
20/05/2010	09h 07m 30.74s	+13° 36' 07.4"	09h 04m 30.95s	+12° 56' 16.8"	369777	76.4	1939	-9.6	0.384	103.4	3558	-0.9	3.6	-0.9	3.6	-1.6	4.3
21/05/2010	10h 00m 51.32s	+08° 08' 43.9"	09h 57m 53.01s	+07° 30' 05.0"	369824	89.6	1939	-10.1	0.498	90.2	3558	0.1	4.9	0.1	4.9	-0.6	5.6
22/05/2010	10h 52m 37.91s	+02° 16' 38.2"	10h 49m 47.60s	+01° 37' 40.8"	370379	102.8	1936	-10.6	0.612	77.1	3552	1.1	5.9	1.1	5.9	0.4	6.5
23/05/2010	11h 43m 48.09s	-03° 41' 01.1"	11h 41m 11.35s	-04° 21' 39.8"	371438	115.9	1930	-11	0.719	64.0	3542	2.1	6.5	2.1	6.5	1.4	7.2
24/05/2010	12h 35m 20.83s	-09° 25' 35.6"	12h 33m 03.33s	-10° 08' 56.6"	373026	128.9	1922	-11.4	0.815	51.0	3527	3.1	6.7	3.0	6.7	2.4	7.4
25/05/2010	13h 28m 06.38s	-14° 38' 43.6"	13h 26m 14.53s	-15° 25' 15.4"	375173	141.9	1911	-11.7	0.894	38.1	3507	3.9	6.5	3.9	6.5	3.3	7.3
26/05/2010	14h 22m 35.74s	-19° 02' 38.3"	14h 21m 16.63s	-19° 52' 09.5"	377895	154.6	1897	-12.1	0.952	25.4	3482	4.5	6.0	4.5	6.0	4.0	6.8
27/05/2010	15h 18m 49.89s	-22° 21' 22.1"	15h 18m 10.17s	-23° 13' 00.1"	381157	167.0	1881	-12.4	0.987	13.0	3452	4.9	5.1	4.9	5.1	4.6	5.9
28/05/2010	16h 16m 13.39s	-24° 22' 55.7"	16h 16m 17.24s	-25° 15' 16.2"	384862	177.0	1863	-12.7	0.999	3.0	3418	5.0	3.9	5.0	3.9	4.9	4.8
29/05/2010	17h 13m 39.71s	-25° 01' 37.9"	17h 14m 26.93s	-25° 53' 05.1"	388842	167.8	1844	-12.4	0.989	12.1	3383	4.9	2.6	4.9	2.6	4.8	3.5
30/05/2010	18h 09m 51.00s	-24° 19' 13.9"	18h 11m 16.64s	-25° 08' 25.7"	392867	156.2	1825	-12.1	0.958	23.7	3349	4.4	1.1	4.4	1.1	4.2	2.0
31/05/2010	19h 03m 43.47s	-22° 24' 00.1"	19h 05m 39.44s	-23° 10' 06.9"	396663	144.7	1807	-11.8	0.909	35.2	3317	3.6	-0.3	3.6	-0.3	3.3	0.5
01/06/2010	19h 54m 44.40s	-19° 28' 09.4"	19h 57m 01.85s	-20° 10' 59.2"	399946	133.4	1793	-11.5	0.845	46.4	3290	2.6	-1.7	2.6	-1.7	2.2	-1.0
02/06/2010	20h 42m 54.54s	-15° 44' 59.8"	20h 45m 25.70s	-16° 24' 52.7"	402443	122.4	1781	-11.2	0.769	57.5	3269	1.4	-3.1	1.4	-3.1	0.9	-2.4
03/06/2010	21h 28m 40.56s	-11° 26' 56.9"	21h 31m 19.38s	-12° 04' 34.6"	403923	111.4	1775	-10.9	0.684	68.4	3257	0.1	-4.2	0.1	-4.2	-0.5	-3.6
04/06/2010	22h 14m 45.26s	-06° 44' 47.3"	22h 15m 27.31s	-07° 21' 04.8"	404224	100.5	1774	-10.5	0.593	79.3	3255	-1.2	-5.2	-1.2	-5.2	-1.8	-4.6
05/06/2010	22h 56m 00.25s	-01° 47' 50.2"	22h 58m 42.13s	-02° 23' 48.5"	403261	89.6	1778	-10.1	0.498	90.2	3263	-2.5	-6.0	-2.5	-6.0	-3.2	-5.4
06/06/2010	23h 39m 21.76s	+03° 15' 18.1"	23h 42m 00.42s	+02° 38' 35.8"	401048	78.7	1788	-9.7	0.403	101.2	3281	-3.6	-6.5	-3.6	-6.5	-4.3	-5.9
07/06/2010	00h 23m 48.51s	+08															



Date	A.R. Geoc.	Dec. Geoc.	A.R. Top.	Dec. Top.	Dist. km	Ei °	Diam. "	Mag	Phase	Phase. angle°	Par.	L1	L2	L3	L4	L5	L6
22/07/2010	16h 42m 14.18s	-24° 51' 41.5"	16h 39m 59.03s	-25° 37' 40.8"	390717	133.3	1835	-11.5	0.843	46.6	3367	6.2	3.3	6.3	3.3	5.6	4.0
23/07/2010	17h 37m 57.22s	-24° 52' 56.3"	17h 36m 14.92s	-25° 41' 09.1"	394310	144.9	1818	-11.8	0.910	35.0	3337	5.6	1.9	5.6	1.9	5.1	2.6
24/07/2010	18h 32m 17.13s	-23° 39' 09.5"	18h 31m 11.96s	-24° 28' 23.6"	397503	156.4	1804	-12.1	0.958	23.5	3310	4.8	0.5	4.8	0.4	4.4	1.2
25/07/2010	19h 24m 26.04s	-21° 18' 44.2"	19h 23m 59.42s	-22° 07' 38.0"	400271	167.7	1791	-12.4	0.988	12.3	3287	3.8	-1.0	3.8	-1.0	3.5	-0.2
26/07/2010	20h 14m 04.96s	-18° 03' 02.6"	20h 14m 12.43s	-18° 50' 22.8"	402577	177.9	1781	-12.7	1.000	2.1	3268	2.7	-2.4	2.7	-2.4	2.5	-1.6
27/07/2010	21h 01m 14.71s	-14° 04' 32.6"	21h 01m 53.47s	-14° 49' 25.3"	404356	169.8	1773	-12.5	0.992	10.2	3254	1.4	-3.6	1.5	-3.7	1.4	-2.9
28/07/2010	21h 46m 20.36s	-09° 35' 22.5"	21h 47m 26.48s	-10° 17' 18.0"	405520	158.9	1768	-12.2	0.967	21.0	3244	0.2	-4.8	0.2	-4.8	0.0	-4.0
29/07/2010	22h 29m 59.19s	-04° 46' 39.7"	22h 31m 29.29s	-05° 25' 32.3"	405954	148.1	1766	-11.9	0.925	31.8	3241	-1.2	-5.6	-1.2	-5.6	-1.4	-5.0
30/07/2010	23h 12m 56.27s	-00° 11' 34.5"	23h 14m 47.71s	-00° 24' 32.4"	405537	137.2	1768	-11.6	0.868	42.7	3244	-2.5	-6.3	-2.5	-6.3	-2.8	-5.7
31/07/2010	23h 56m 01.16s	+05° 10' 02.0"	23h 58m 11.90s	+04° 36' 03.5"	404155	126.3	1774	-11.3	0.797	53.5	3255	-3.7	-6.7	-3.7	-6.7	-4.1	-6.1
01/08/2010	00h 40m 06.12s	+09° 59' 29.1"	00h 42m 34.30s	+09° 26' 43.3"	401730	115.4	1785	-11.1	0.715	64.5	3275	-4.9	-6.8	-4.9	-6.8	-5.4	-6.2
02/08/2010	01h 26m 04.21s	+14° 29' 56.3"	01h 28m 47.47s	+13° 57' 11.7"	398235	104.2	1800	-10.6	0.624	75.6	3304	-5.9	-6.6	-5.9	-6.6	-6.5	-6.0
03/08/2010	02h 14m 45.60s	+18° 29' 46.4"	02h 17m 40.21s	+17° 55' 40.3"	393725	92.9	1821	-10.2	0.526	87.0	3342	-6.6	-6.0	-6.6	-6.0	-7.3	-5.5
04/08/2010	03h 06m 50.08s	+21° 45' 07.1"	03h 09m 49.83s	+21° 08' 15.1"	388351	81.2	1846	-9.8	0.425	98.7	3388	-7.1	-5.2	-7.1	-5.2	-7.8	-4.7
05/08/2010	04h 02m 34.73s	+24° 00' 00.6"	04h 05m 30.13s	+23° 19' 13.1"	382371	69.1	1875	-9.2	0.323	110.7	3441	-7.3	-4.1	-7.2	-4.1	-7.9	-3.5
06/08/2010	05h 01m 39.64s	+24° 58' 00.8"	05h 04m 18.28s	+24° 12' 46.5"	376155	56.6	1906	-8.6	0.226	123.2	3498	-7.0	-2.7	-7.0	-2.8	-7.6	-2.0
07/08/2010	06h 03m 01.32s	+24° 25' 42.2"	06h 05m 10.10s	+23° 36' 28.8"	370162	43.7	1937	-7.8	0.139	136.2	3554	-6.3	-1.2	-6.3	-1.2	-6.9	-0.4
08/08/2010	07h 05m 05.40s	+22° 17' 05.1"	07h 06m 33.98s	+21° 25' 24.4"	364900	30.3	1965	-6.8	0.069	149.6	3606	-5.1	0.5	-5.1	0.5	-5.6	1.3
09/08/2010	08h 06m 18.17s	+18° 36' 47.4"	08h 07m 01.47s	+17° 44' 54.6"	360863	16.6	1987	-5.6	0.021	163.4	3646	-3.6	2.2	-3.6	2.2	-3.9	3.1
10/08/2010	09h 05m 38.30s	+13° 40' 07.3"	09h 05m 36.42s	+12° 50' 22.6"	358453	3.8	2000	-4.3	0.001	176.2	3670	-1.8	3.8	-1.7	3.8	-1.9	4.6
11/08/2010	10h 02m 49.67s	+07° 50' 06.7"	10h 02m 05.95s	+07° 04' 16.4"	357899	12.4	2003	-5.2	0.012	167.6	3676	0.3	5.1	0.3	5.1	0.3	5.9
12/08/2010	10h 58m 14.02s	+01° 33' 21.9"	10h 56m 52.98s	+00° 52' 12.9"	359220	26.4	1996	-6.5	0.052	153.5	3663	2.3	6.1	2.3	6.1	2.1	6.8
13/08/2010	11h 52m 34.62s	-04° 43' 37.2"	11h 50m 40.89s	-05° 20' 23.3"	362221	40.3	1979	-7.6	0.119	139.6	3632	4.1	6.6	4.2	6.6	3.8	7.2
14/08/2010	12h 46m 40.24s	-10° 36' 53.4"	12h 44m 18.55s	-11° 10' 29.6"	366540	54.0	1956	-8.4	0.207	125.9	3589	5.7	6.7	5.7	6.7	5.2	7.2
15/08/2010	13h 41m 12.08s	-15° 46' 14.0"	13h 38m 27.96s	-16° 18' 27.3"	371726	67.2	1929	-9.2	0.307	112.7	3539	6.8	6.4	6.8	6.3	6.3	6.8
16/08/2010	14h 36m 33.37s	-19° 55' 38.7"	14h 33m 33.99s	-20° 28' 23.3"	373719	80.0	1900	-9.7	0.415	99.8	3487	7.5	5.6	7.5	5.6	6.8	6.1
17/08/2010	15h 32m 41.96s	-22° 53' 33.4"	15h 29m 36.56s	-23° 28' 27.4"	382906	92.4	1872	-10.2	0.523	87.4	3436	7.7	4.7	7.7	4.6	7.0	5.2
18/08/2010	16h 29m 08.66s	-24° 33' 19.9"	16h 26m 08.04s	-25° 11' 22.3"	388167	104.5	1847	-10.6	0.626	75.4	3389	7.5	3.4	7.5	3.4	6.8	4.0
19/08/2010	17h 25m 04.44s	-24° 53' 34.4"	17h 22m 19.33s	-25° 34' 56.9"	392878	116.2	1825	-11.1	0.722	63.7	3349	6.9	2.1	7.0	2.1	6.3	2.7
20/08/2010	18h 19m 35.53s	-23° 58' 02.8"	18h 17m 14.60s	-24° 42' 11.5"	396912	127.6	1806	-11.3	0.806	52.3	3315	6.1	0.7	6.1	0.7	5.5	1.3
21/08/2010	19h 11m 59.53s	-21° 54' 41.9"	19h 10m 08.36s	-22° 40' 31.6"	400215	138.8	1791	-11.7	0.877	41.1	3287	5.1	-0.7	5.1	-0.8	4.6	0.0
22/08/2010	20h 01m 56.18s	-18° 54' 08.1"	20h 00m 36.92s	-19° 40' 18.9"	402787	149.9	1780	-11.9	0.933	30.0	3266	3.9	-2.1	3.9	-2.1	3.5	-1.4
23/08/2010	20h 49m 28.09s	-15° 08' 02.4"	20h 48m 40.61s	-15° 53' 15.8"	404651	160.7	1772	-12.2	0.972	19.2	3251	2.6	-3.4	2.7	-3.4	2.3	-2.7
24/08/2010	21h 34m 56.46s	-10° 48' 03.4"	21h 34m 39.42s	-11° 31' 12.6"	405837	171.1	1767	-12.5	0.994	8.8	3242	1.3	-4.5	1.4	-4.5	1.1	-3.8
25/08/2010	22h 18m 54.79s	-06° 05' 11.5"	22h 19m 06.54s	-06° 45' 29.9"	406361	175.1	1764	-12.6	0.998	4.9	3238	0.0	-5.4	0.0	-5.4	0.1	-4.7
26/08/2010	23h 02m 03.74s	-01° 09' 47.2"	23h 02m 42.91s	-01° 46' 49.8"	406214	165.7	1765	-12.4	0.985	14.3	3239	-1.3	-6.1	-1.3	-6.1	-1.3	-5.5
27/08/2010	23h 45m 07.87s	+03° 48' 20.3"	23h 46m 13.57s	+03° 14' 33.6"	405363	155.0	1769	-12.1	0.953	24.9	3246	-2.5	-6.5	-2.5	-6.5	-2.6	-5.9
28/08/2010	00h 28m 53.69s	+08° 39' 27.3"	00h 30m 25.39s	+08° 08' 31.0"	403758	144.2	1776	-11.8	0.906	35.7	3258	-3.7	-6.6	-3.7	-6.6	-3.9	-6.1
29/08/2010	01h 14m 07.87s	+13° 13' 25.5"	01h 16m 05.12s	+12° 44' 28.5"	401343	133.2	1786	-11.5	0.843	46.7	3278	-4.8	-6.5	-4.8	-6.5	-5.1	-6.0
30/08/2010	02h 01m 34.49s	+17° 19' 10.0"	02h 03m 56.22s	+16° 50' 57.7"	398079	122.1	1801	-11.2	0.767	57.8	3305	-5.8	-6.0	-5.8	-6.0	-6.2	-5.6
31/08/2010	02h 51m 49.77s	+20° 44' 15.5"	02h 54m 33.30s	+20° 15' 15.0"	393966	110.7	1820	-10.8	0.678	69.1	3339	-6.5	-5.3	-6.5	-5.3	-7.1	-4.8
01/09/2010	03h 45m 13.59s	+23° 14' 58.1"	03h 48m 13.51s	+22° 43' 29.9"	389069	99.1	1843	-10.5	0.580	80.7	3382	-7.1	-4.3	-7.1	-4.3	-7.7	-3.8
02/09/2010	04h 41m 39.40s	+24° 37' 09.2"	04h 44m 46.76s	+24° 01' 46.7"	383544	87.2	1869	-10.0	0.476	92.7	3430	-7.3	-3.0	-7.3	-3.0	-8.0	-2.5
03/09/2010	05h 40m 27.69s	+24° 38' 18.9"	05h 43m 30.47s	+23° 58' 13.8"	377645	74.8	1898	-9.5	0.370	105.1	3484	-7.2	-1.6	-7.2	-1.6	-7.9	-0.9
04/09/2010	06h 40m 31.07s	+23° 10' 33.7"	06h 43m 16.22s	+22° 25' 57.6"	371737	62.0	1929	-8.9	0.266	117.8	3539	-6.6	0.0	-6.6	0.0	-7.3	0.7
05/09/2010	07h 40m 33.67s	+20° 13' 22.8"	07h 42m 49.97s	+19° 25' 34.7"	366267	48.8	1957	-8.1	0.171	131.1	3592	-5.6	1.7	-5.6	1.6	-6.2	2.4
06/09/2010	08h 39m 36.15s	+15° 54' 59.0"	08h 41m 16.12s	+15° 06' 10.1"	361732	35.2	1982	-7.2	0.092	144.7	3637	-4.2	3.2	-4.2	3.2	-4.7	4.0
07/09/2010	09h 37m 12.10s	+10° 31' 43.2"	09h 38m 12.12s	+09° 44' 24.3"	358599	21.4	1999	-6.1	0.035	158.6	3669	-2.4	4.6	-2.4	4.6	-2.8	5.4
08/09/2010	10h 33m 29.25s	+04° 26' 03.9"	10h 33m 48.32s	+03° 42' 26.7"	357232	8.1	2007	-4.8	0.005	171.9	3683	-0.3	5.7	-0.3	5.7	-0.5	6.4
09/09/2010	11h 28m 59.37s	-01° 56' 01.1"	11h 28m 37.84s	-02° 34' 38.0"	357808	8.9	2004	-4.8	0.006	171.1	3677	1.8	6.4	1.9	6.4	1.8	7.0
10/09/2010	12h 24m 24.20s	-08° 07' 48.5"	12h 23m 23.11s	-08° 41' 18.2"	360279	22.2	1990	-6.2	0.037	157.7	3652	3.9	6.6	3.9	6.6	3.8	7.1
11/09/2010	13h 20m 21.49s	-13° 44' 20.0"	13h 18m 42.74s	-14° 13' 46.1"	364381	35.9	1968	-7.3	0.095	144.0	3611	5.6	6.4	5.6	6.3	5.4	6.8
12/09/2010	14h 17m 12.41s	-18° 24' 27.8"	14h 14m 59.68s	-18° 51' 44.6"	369688	49.2	1939	-8.2	0.174	130.7	3559	6.9	5.7	6.9	5.7	6.5	6.1
13/09/2010	15h 14m 52.15s	-21° 52' 30.5"	15h 12m 11.85s	-22° 19' 51.2"	375692	62.1	1908	-8.9	0.267	117.7	3502	7.7	4.8	7.7	4.8	7.2	5.1
14/09/2010	16h 12m 47.28s	-23° 59' 19.2"	16h 09m 48.88s	-24° 28' 41.3"	381889	74.6	1877	-9.5	0.368	105.2	3445	8.0	3.6	8.0	3.6	7.4	4.0
15/09/2010	17h 10m 03.56s	-24° 42' 41.0"	17h 06m 58.52s	-25° 15' 19.7"	387833	86.6	1849	-10.0	0.472	93.2	3392	7.8	2.2	7.8	2.2	7.1	2.7
16/09/2010	18h 05m 42.93s	-24° 06' 41.0"	18h 02m 42.64s	-24° 42' 58.4"	393180	98.3	1823	-10.4	0.574	81.5	3346	7.2	0.8	7.2	0.8	6.5	1.3
17/09/2010	18h 59m 01.43s	-22° 20' 02.8"	18h 56m 15.21s	-22° 59' 32.4"	397966	109.7	1803	-10.8	0.669	70.2	3308	6.3	-0.6	6.3	-0.6	5.6	0.0
18/09/2010	19h 49m 39.53s	-19° 33' 59.6"	19h 47m 13.70s	-20° 15' 41.5"	401251	120.8	1787	-11.1	0.757	59.1	3279	5.2	-2.0	5.2	-2.0	4.6	-1.4
19/09/2010	20h 37m 42.36s																

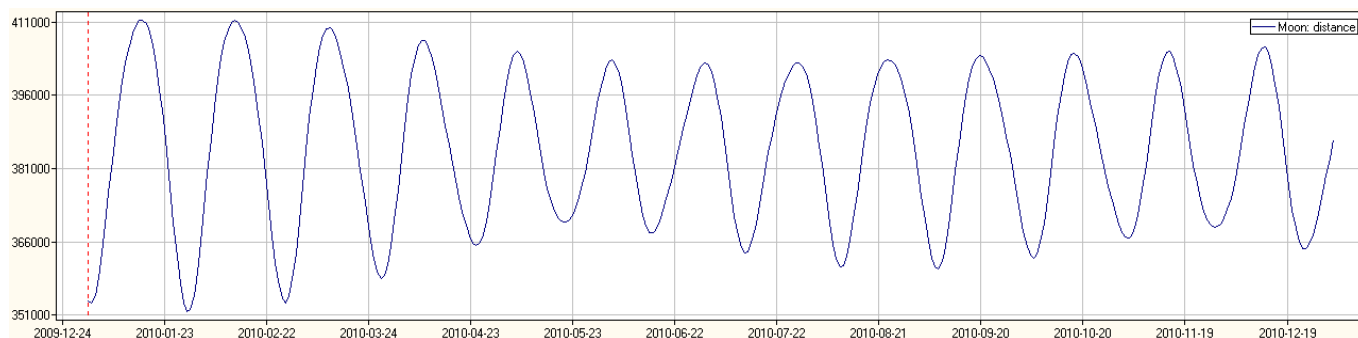
Date	A.R. Geoc.	Dec. Geoc.	A.R. Top.	Dec. Top.	Dist. km	El °	Diam. "	Mag	Phase	Phase. angle°	Par.	L1	L2	L3	L4	L5	L6
03/11/2010	11h 37m 47.95s	-03° 05' 45.3"	11h 39m 54.16s	-03° 43' 32.9"	364565	44.5	1967	-7.9	0.144	135.4	3609	-0.4	6.6	-0.4	6.6	-1.0	7.2
04/11/2010	12h 31m 54.56s	-08° 57' 07.7"	12h 33m 31.45s	-09° 30' 18.0"	364226	30.9	1968	-6.9	0.071	149.0	3612	1.2	6.6	1.2	6.6	0.7	7.2
05/11/2010	13h 27m 41.61s	-14° 18' 00.4"	13h 28m 42.99s	-14° 45' 48.5"	365226	17.5	1963	-5.7	0.023	162.5	3602	2.8	6.2	2.8	6.2	2.4	6.6
06/11/2010	14h 25m 28.13s	-18° 45' 58.4"	14h 25m 48.15s	-19° 08' 53.3"	367611	5.3	1950	-4.5	0.002	174.7	3579	4.2	5.3	4.2	5.3	3.9	5.7
07/11/2010	15h 24m 56.96s	-22° 01' 39.8"	15h 24m 31.89s	-22° 21' 20.1"	371272	10.5	1931	-5	0.008	169.4	3544	5.3	4.2	5.3	4.2	5.2	4.5
08/11/2010	16h 25m 10.34s	-23° 52' 14.0"	16h 24m 00.73s	-24° 11' 00.2"	375950	23.1	1907	-6.2	0.040	156.9	3500	6.1	2.8	6.1	2.8	6.0	3.1
09/11/2010	17h 24m 42.94s	-24° 13' 57.3"	17h 22m 54.50s	-24° 34' 09.6"	381272	35.5	1880	-7.2	0.094	144.4	3451	6.4	1.3	6.4	1.3	6.1	1.6
10/11/2010	18h 22m 10.02s	-23° 12' 18.5"	18h 19m 52.33s	-23° 35' 39.0"	386806	47.7	1854	-8.1	0.164	132.2	3401	6.3	-0.2	6.3	-0.2	5.9	0.1
11/11/2010	19h 16m 34.71s	-18° 59' 20.8"	19h 13m 58.47s	-21° 26' 35.8"	392112	59.4	1828	-8.8	0.246	120.5	3355	5.8	-1.7	5.8	-1.7	5.3	-1.3
12/11/2010	20h 07m 39.21s	-17° 49' 52.5"	20h 04m 53.87s	-18° 20' 56.0"	396796	70.8	1807	-9.3	0.337	109.0	3316	5.0	-3.0	5.0	-3.0	4.4	-2.6
13/11/2010	20h 55m 39.63s	-13° 58' 20.9"	20h 52m 52.37s	-14° 32' 39.1"	400542	81.9	1790	-9.8	0.431	97.9	3285	3.9	-4.2	4.0	-4.2	3.3	-3.7
14/11/2010	21h 41m 13.95s	-09° 37' 19.8"	21h 38m 29.84s	-10° 13' 26.7"	403132	92.9	1778	-10.2	0.527	87.0	3264	2.7	-5.2	2.7	-5.2	2.1	-4.7
15/11/2010	22h 25m 11.27s	-04° 57' 18.8"	22h 22m 33.93s	-05° 34' 07.9"	404452	103.7	1773	-10.6	0.620	76.1	3253	1.4	-6.0	1.5	-6.0	0.8	-5.4
16/11/2010	23h 08m 25.04s	-00° 07' 19.6"	23h 05m 57.41s	-00° 43' 32.0"	404496	114.5	1772	-10.9	0.709	65.3	3253	0.1	-6.5	0.2	-6.5	-0.5	-5.9
17/11/2010	23h 51m 49.58s	+04° 44' 07.7"	23h 49m 34.68s	+04° 09' 46.7"	403349	125.4	1777	-11.3	0.790	54.5	3262	-1.1	-6.7	-1.1	-6.7	-1.7	-6.1
18/11/2010	00h 36m 18.16s	+09° 28' 04.0"	00h 34m 19.65s	+08° 56' 38.8"	401179	136.3	1787	-11.6	0.862	43.6	3279	-2.2	-6.6	-2.2	-6.6	-2.7	-6.1
19/11/2010	01h 22m 40.51s	+13° 54' 07.8"	01h 21m 03.19s	+13° 26' 23.4"	398216	147.5	1800	-11.9	0.922	32.4	3304	-3.1	-6.3	-3.1	-6.3	-3.6	-5.8
20/11/2010	02h 11m 38.25s	+17° 49' 59.9"	02h 10m 28.16s	+17° 26' 10.6"	394721	158.8	1816	-12.2	0.966	21.1	3333	-3.8	-5.6	-3.8	-5.6	-4.2	-5.2
21/11/2010	03h 03m 36.82s	+20° 01' 03.5"	03h 03m 00.80s	+20° 41' 03.5"	390966	170.2	1834	-12.5	0.993	9.8	3365	-4.3	-4.6	-4.3	-4.6	-4.6	-4.3
22/11/2010	03h 58m 34.91s	+23° 13' 19.8"	03h 58m 39.17s	+22° 55' 07.9"	387198	176.2	1852	-12.6	0.999	3.8	3398	-4.6	-3.4	-4.5	-3.4	-4.7	-3.1
23/11/2010	04h 55m 56.27s	+23° 12' 06.1"	04h 56m 44.21s	+23° 54' 05.9"	383622	165.0	1869	-12.3	0.983	14.9	3430	-4.6	-2.0	-4.6	-2.0	-4.6	-1.7
24/11/2010	05h 54m 32.44s	+23° 48' 45.8"	05h 56m 02.70s	+23° 28' 41.9"	380380	152.8	1885	-12	0.945	27.1	3459	-4.5	-0.5	-4.5	-0.5	-4.6	-0.2
25/11/2010	06h 53m 01.23s	+22° 01' 31.9"	06h 55m 07.44s	+21° 37' 29.7"	377546	140.3	1899	-11.7	0.885	39.6	3485	-4.2	1.1	-4.2	1.1	-4.5	1.5
26/11/2010	07h 50m 13.58s	+18° 56' 24.8"	07h 52m 46.23s	+18° 27' 23.4"	375141	127.6	1911	-11.3	0.806	52.3	3507	-3.7	2.7	-3.7	2.7	-4.1	3.1
27/11/2010	08h 45m 33.72s	+14° 45' 36.6"	08h 48m 22.74s	+14° 11' 43.3"	373152	114.7	1921	-11	0.710	65.1	3526	-3.0	4.1	-3.0	4.1	-3.6	4.6
28/11/2010	09h 39m 33.60s	+09° 44' 56.7"	09h 42m 00.12s	+09° 07' 21.4"	371134	101.8	1930	-10.6	0.603	78.1	3541	-2.2	5.3	-2.2	5.3	-2.9	5.9
29/11/2010	10h 31m 15.10s	+04° 11' 46.1"	10h 34m 11.86s	+03° 32' 23.3"	370375	88.7	1936	-10.1	0.490	91.2	3552	-1.3	6.2	-1.2	6.1	-2.0	6.8
30/11/2010	11h 22m 58.18s	-01° 36' 01.1"	11h 25m 48.96s	-02° 14' 56.2"	369638	75.6	1940	-9.5	0.376	104.3	3559	-0.2	6.7	-0.2	6.7	-0.9	7.3
01/12/2010	12h 15m 09.60s	-07° 20' 02.6"	12h 17m 48.28s	-07° 56' 18.9"	369439	62.4	1941	-8.9	0.269	117.5	3561	1.0	6.8	1.0	6.8	0.2	7.4
02/12/2010	13h 08m 42.38s	-12° 41' 13.9"	13h 11m 02.09s	-13° 13' 09.4"	368999	49.2	1938	-8.2	0.174	130.7	3557	2.1	6.4	2.1	6.4	1.4	7.0
03/12/2010	14h 04m 14.01s	-17° 19' 59.7"	14h 06m 06.77s	-17° 46' 44.4"	371134	36.0	1932	-7.3	0.096	143.9	3545	3.2	5.7	3.2	5.7	2.6	6.2
04/12/2010	15h 01m 52.95s	-20° 57' 29.1"	15h 03m 10.38s	-21° 19' 20.3"	373224	23.0	1921	-6.2	0.040	157.0	3525	4.1	4.7	4.1	4.7	3.6	5.1
05/12/2010	16h 01m 07.70s	-23° 18' 10.4"	16h 01m 42.91s	-23° 36' 32.7"	376171	10.1	1906	-5	0.008	169.8	3497	4.8	3.4	4.8	3.3	4.5	3.7
06/12/2010	17h 00m 47.70s	-24° 13' 05.9"	17h 00m 37.75s	-24° 30' 09.2"	379883	3.2	1887	-4.2	0.001	176.8	3463	5.2	1.9	5.2	1.9	5.1	2.1
07/12/2010	17h 59m 22.81s	-23° 42' 05.3"	17h 58m 30.00s	-24° 00' 07.6"	384162	15.1	1866	-5.5	0.017	164.8	3425	5.3	0.3	5.3	0.3	5.3	0.6
08/12/2010	18h 55m 33.64s	-21° 53' 22.7"	18h 54m 04.60s	-22° 14' 12.7"	388728	27.2	1844	-6.6	0.055	152.8	3384	5.1	-1.2	5.1	-1.3	4.9	-0.9
09/12/2010	19h 48m 34.87s	-19° 00' 41.3"	19h 46m 38.16s	-19° 25' 18.3"	393246	38.9	1823	-7.5	0.111	141.0	3346	4.6	-2.7	4.6	-2.7	4.3	-2.3
10/12/2010	20h 38m 20.44s	-15° 19' 31.3"	20h 36m 04.26s	-15° 48' 04.5"	397362	50.3	1804	-8.2	0.181	129.6	3311	3.8	-4.0	3.8	-4.0	3.4	-3.5
11/12/2010	21h 25m 14.96s	-11° 04' 24.8"	21h 22m 45.98s	-11° 36' 24.0"	400747	61.4	1789	-8.9	0.262	118.4	3283	2.8	-5.0	2.8	-5.1	2.3	-4.6
12/12/2010	22h 10m 01.44s	-06° 27' 42.9"	22h 07m 24.65s	-07° 02' 12.3"	403126	72.4	1778	-9.4	0.350	107.4	3264	1.6	-5.9	1.6	-5.9	1.0	-5.3
13/12/2010	22h 53m 31.77s	-01° 39' 36.8"	22h 50m 50.93s	-02° 15' 26.2"	404300	83.3	1773	-9.9	0.443	96.6	3254	0.3	-6.5	0.3	-6.5	-0.3	-5.9
14/12/2010	23h 36m 41.32s	+03° 11' 09.2"	23h 33m 59.55s	+02° 35' 16.9"	404165	94.1	1774	-10.3	0.537	85.8	3255	-0.9	-6.8	-0.9	-6.8	-1.6	-6.2
15/12/2010	00h 20m 26.24s	+07° 56' 17.3"	00h 17m 46.77s	+07° 21' 40.0"	402720	104.9	1780	-10.7	0.630	74.9	3267	-2.2	-6.8	-2.2	-6.8	-2.8	-6.2
16/12/2010	01h 05m 41.58s	+12° 26' 51.2"	01h 03m 08.40s	+11° 54' 41.1"	400068	115.9	1792	-11	0.720	63.9	3289	-3.2	-6.5	-3.2	-6.5	-3.9	-5.9
17/12/2010	01h 53m 18.06s	+16° 32' 16.5"	01h 50m 56.67s	+16° 03' 31.7"	396407	127.1	1809	-11.3	0.803	52.7	3319	-4.1	-5.9	-4.1	-5.9	-4.8	-5.4
18/12/2010	02h 43m 55.68s	+19° 59' 44.1"	02h 41m 53.50s	+19° 34' 55.4"	392023	138.6	1829	-11.6	0.876	41.3	3356	-4.8	-5.0	-4.8	-5.1	-5.3	-4.6
19/12/2010	03h 37m 53.14s	+22° 34' 20.9"	03h 36m 19.31s	+22° 13' 16.3"	387258	150.4	1851	-12	0.935	29.5	3397	-5.1	-3.9	-5.1	-3.9	-5.6	-3.5
20/12/2010	04h 34m 55.37s	+24° 00' 43.5"	04h 33m 59.27s	+23° 42' 16.4"	382485	162.6	1874	-12.3	0.977	17.4	3440	-5.2	-2.5	-5.1	-2.5	-5.5	-2.2
21/12/2010	05h 34m 07.13s	+24° 06' 05.0"	05h 33m 55.77s	+23° 48' 16.1"	378064	175.1	1896	-12.6	0.998	4.9	3480	-4.9	-1.0	-4.9	-1.0	-5.1	-0.7
22/12/2010	06h 34m 02.80s	+22° 44' 03.2"	06h 34m 38.15s	+22° 24' 27.0"	374304	172.1	1915	-12.5	0.995	7.9	3515	-4.3	0.7	-4.3	0.7	-4.4	1.0
23/12/2010	07h 33m 13.32s	+19° 57' 13.4"	07h 34m 31.72s	+19° 33' 41.1"	371420	159.1	1930	-12.2	0.967	20.9	3542	-3.5	2.3	-3.5	2.3	-3.7	2.7
24/12/2010	08h 30m 35.89s	+15° 56' 53.7"	08h 32m 29.84s	+15° 28' 12.9"	369518	145.9	1940	-11.8	0.914	34.0	3560	-2.6	3.8	-2.6	3.8	-2.9	4.3
25/12/2010	09h 25m 49.01s	+11° 00' 22.4"	09h 28m 09.84s	+10° 26' 35.6"	368591	132.6	1945	-11.5	0.839	47.3	3569	-1.5	5.1	-1.5	5.1	-1.9	5.6
26/12/2010	10h 19m 09.44s	+05° 27' 37.2"	10h 21m 49.13s	+04° 49' 55.8"	368542	119.3	1945	-11.1	0.746	60.6	3570	-0.3	6.1	-0.3	6.1	-0.8	6.7
27/12/2010	11h 11m 19.54s	-00° 21' 11.2"	11h 14m 11.19s	-01° 00' 49.0"	369223	106.1	1942	-10.7	0.639	73.8	3563	0.9	6.6	0.9	6.6	0.2	7.3
28/12/2010	12h 03m 13.76s	-06° 06' 45.6"	12h 06m 11.16s	-06° 46' 01.8"	370475	92.9	1935	-10.2	0.526	87.0	3551	2.0	6.8	2.0	6.8	1.3	7.5
29/12/2010	12h 55m 47.19s	-11° 30' 48.8"	12h 58m 43.87s	-12° 07' 32.5"	372165	79.9	1926	-9.7	0.413	100.0	3535	2.9	6.6	2.9	6.6	2.2	7.2
30/12/2010	13h 49m 45.00s	-16° 15' 52.5"	13h 52m 33.38s	-16° 48' 23.7"	374207	66.9	1916	-9.1	0.305	112.9	3516	3.7	6.0	3.8	6.0	3.0	6.5
31/12/2010	14h 45m 31.11s	-20° 05' 30.0"	14h 48m 02.16s	-20° 32' 59.1"	376561	54.2	1904	-8.5	0.208	125.7	3494	4.4	5.0	4.4	5.0	3.7	5.5

A.R. e DEC. = coordinate apparenti geocentriche e



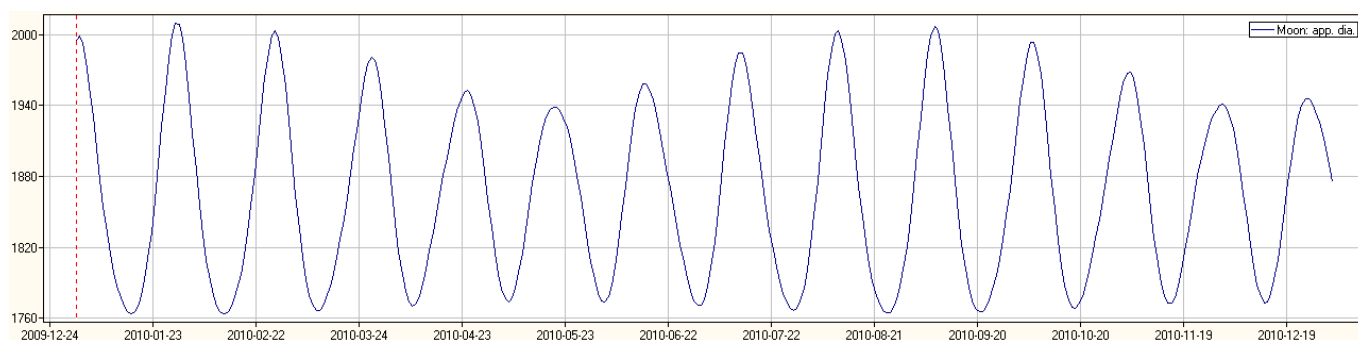
Distanza geocentrica della Luna in km nel corso dell'anno

Geocentric distance of the Moon in km during the year



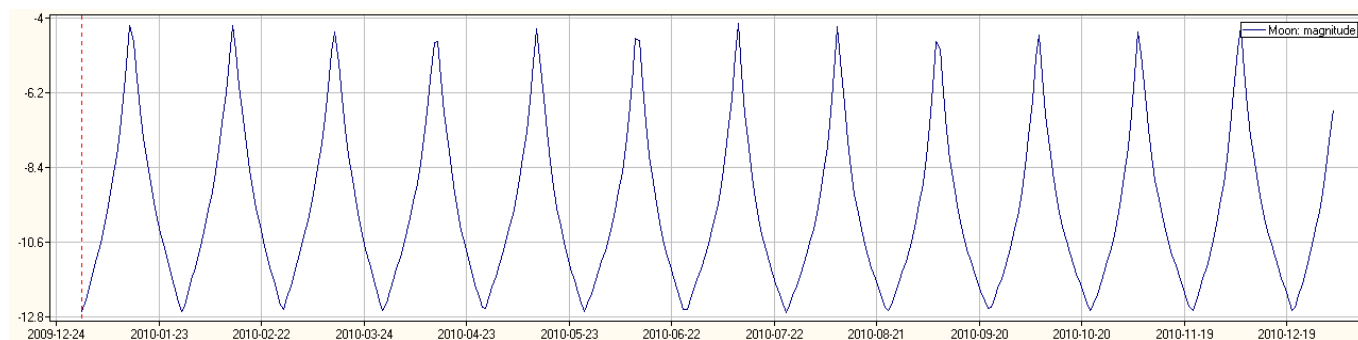
Distanza topocentrica della Luna in km nel corso dell'anno

Topocentric distance of the Moon in km during the year



Diametro geocentrico della Luna in " nel corso dell'anno

Geocentric diameter of the Moon in " during the year



Magnitudine della Luna nel corso dell'anno

Magnitude of the Moon during the year

# EFFEMERIDI FISICHE DELLA LUNA

## PHYSICAL EPHEMERIDES OF THE MOON

Date		l	b	Axis	Coln	Lat	%ill	Date		l	b	Axis	Coln	Lat	%ill
		o	o	o	o	o				o	o	o	o	o	
Jan	1	-2.0	-1.0	4.1	94.6	-0.3	100	Apr	3	6.8	4.5	12.2	134.1	1.5	82
Gen	3	1.7	2.5	15.0	118.9	-0.2	93		5	5.8	2.0	1.7	158.5	1.5	63
	5	4.8	5.3	21.4	143.2	-0.2	76		7	3.6	-0.8	351.7	182.8	1.5	44
	7	6.7	6.7	23.0	167.5	-0.1	55		9	0.8	-3.4	343.9	207.2	1.5	26
	9	7.1	6.6	19.9	191.8	-0.1	34		11	-1.8	-5.4	338.8	231.7	1.5	12
	11	6.2	5.1	12.5	216.1	0.0	16		13	-3.8	-6.4	336.8	256.1	1.5	2
	13	4.3	2.7	2.5	240.5	0.0	5		15	-4.9	-6.3	338.7	280.5	1.5	0
	15	1.9	-0.1	352.5	264.9	0.1	0		17	-5.2	-5.0	345.2	305.0	1.5	7
	17	-0.9	-2.8	344.5	289.2	0.2	3		19	-4.8	-2.5	355.7	329.4	1.5	21
	19	-3.6	-5.0	339.2	313.6	0.2	12		21	-3.7	0.7	7.2	353.9	1.5	41
	21	-5.9	-6.5	336.9	337.9	0.3	27		23	-2.0	3.7	16.6	18.2	1.5	64
	23	-7.4	-6.8	338.4	2.3	0.3	45		25	0.4	5.9	22.2	42.6	1.5	84
	25	-7.5	-5.7	344.4	26.6	0.4	66		27	3.1	6.6	22.9	67.0	1.4	97
	27	-6.0	-3.2	355.0	50.9	0.4	85		29	5.0	5.7	18.3	91.3	1.4	100
	29	-2.9	0.1	7.4	75.1	0.5	98	May	1	5.6	3.6	9.1	115.7	1.4	93
	31	1.1	3.5	17.3	99.4	0.5	99	Mag	3	4.7	0.8	358.4	140.0	1.4	79
Feb	2	4.8	5.9	22.4	123.7	0.6	89		5	2.5	-2.0	348.8	164.4	1.3	61
	4	7.2	6.8	22.5	147.9	0.7	71		7	-0.1	-4.4	341.8	188.8	1.3	42
	6	7.7	6.1	17.6	172.3	0.7	50		9	-2.6	-6.0	337.7	213.3	1.3	24
	8	6.6	4.2	8.9	196.6	0.8	30		11	-4.3	-6.6	336.9	237.7	1.2	10
	10	4.4	1.6	358.7	221.0	0.8	14		13	-5.0	-6.0	340.4	262.2	1.2	1
	12	1.6	-1.2	349.3	245.3	0.9	4		15	-4.6	-4.0	348.6	286.7	1.2	1
	14	-1.2	-3.7	342.2	269.7	0.9	0		17	-3.4	-1.1	0.1	311.2	1.1	10
	16	-3.7	-5.6	337.9	294.1	0.9	3		19	-1.8	2.1	11.3	335.6	1.1	28
	18	-5.7	-6.7	337.0	318.5	1.0	13		21	0.1	4.9	19.3	0.1	1.1	50
	20	-7.0	-6.5	339.9	342.8	1.0	29		23	2.0	6.5	23.1	24.5	1.0	72
	22	-7.3	-4.9	347.5	7.2	1.1	50		25	3.8	6.5	22.0	48.9	1.0	90
	24	-6.2	-2.1	358.7	31.5	1.1	71		27	4.8	5.1	15.8	73.3	1.0	99
	26	-3.5	1.2	10.5	55.8	1.2	90		29	4.8	2.6	5.8	97.6	0.9	99
	28	0.2	4.3	19.2	80.1	1.2	99		31	3.5	-0.3	355.1	122.0	0.9	91
Mar	2	4.1	6.2	23.0	104.4	1.2	97	Jun	2	1.3	-3.0	346.2	146.4	0.8	77
	4	6.8	6.6	21.5	128.7	1.3	85	Giu	4	-1.2	-5.2	340.1	170.8	0.8	59
	6	7.6	5.4	15.0	153.0	1.3	67		6	-3.6	-6.5	337.0	195.3	0.7	40
	8	6.6	3.1	5.2	177.3	1.3	47		8	-5.2	-6.7	337.5	219.7	0.7	22
	10	4.2	0.4	355.0	201.7	1.3	28		10	-5.6	-5.5	342.4	244.2	0.6	7
	12	1.3	-2.3	346.4	226.1	1.4	13		12	-4.7	-3.1	352.1	268.7	0.6	0
	14	-1.4	-4.6	340.3	250.5	1.4	3		14	-2.7	0.1	4.2	293.2	0.5	3
	16	-3.7	-6.1	337.1	274.9	1.4	0		16	-0.2	3.4	14.7	317.7	0.5	16
	18	-5.3	-6.6	337.5	299.3	1.4	4		18	2.2	5.8	21.3	342.2	0.4	37
	20	-6.1	-5.8	342.2	323.7	1.5	16		20	4.1	6.8	23.3	6.6	0.4	59
	22	-6.2	-3.8	351.3	348.1	1.5	34		22	5.2	6.2	20.3	31.1	0.3	79
	24	-5.4	-0.8	2.9	12.5	1.5	56		24	5.4	4.3	12.5	55.5	0.3	94
	26	-3.3	2.4	13.6	36.8	1.5	78		26	4.5	1.5	2.1	79.9	0.2	100
	28	-0.1	5.1	20.8	61.1	1.5	94		28	2.8	-1.3	351.8	104.2	0.2	98
	30	3.3	6.5	23.2	85.5	1.5	100		30	0.4	-3.9	343.8	128.6	0.1	89
Apr	1	5.9	6.2	20.1	109.8	1.5	95	Jul	2	-2.2	-5.8	338.6	153.1	0.0	74

Legenda:

l = librazione in longitudine, in °  
b = librazione in latitudine, in °  
axis = angolo di posizione del polo nord lunare, in °  
coln = colongitudine del Sole, ossia longitudine del terminatore lunare, in °  
lat = latitudine del Sole, riferita all'equatore lunare, in °  
ill = percentuale di Luna illuminata

l = libration in longitude, in °  
b = libration in latitude, in °  
axis = angle of position from the lunar north pole, in °  
coln = solar colongitude, alias longitude of the lunar limb, in °  
lat = latitude of the Sun, referred to the lunar equator, in °  
ill = lunar lightning

Date		l	b	Axis	Coln	Lat	%ill	Date		l	b	Axis	Coln	Lat	%ill
		o	o	o	o	o				o	o	o	o	o	
Jul	1	-0.9	-5.0	340.8	140.9	0.1	82	Oct	1	-6.6	-0.1	0.9	184.4	-1.5	52
Lug	3	-3.4	-6.4	337.2	165.3	0.0	65	Ott	3	-5.4	3.0	11.8	208.8	-1.5	30
	5	-5.5	-6.8	337.0	189.7	0.0	46		5	-2.6	5.4	19.9	233.2	-1.5	11
	7	-6.5	-5.9	341.0	214.2	-0.1	27		7	1.2	6.5	23.4	257.7	-1.5	1
	9	-6.2	-3.6	349.8	238.7	-0.1	10		9	4.8	5.9	21.2	282.1	-1.5	2
	11	-4.3	-0.5	1.7	263.2	-0.2	1		11	7.0	3.9	13.4	306.5	-1.5	14
	13	-1.2	2.9	13.1	287.7	-0.2	2		13	7.3	1.0	2.5	331.0	-1.5	31
	15	2.2	5.5	20.7	312.2	-0.3	14		15	5.9	-1.9	352.1	355.3	-1.5	51
	17	5.0	6.8	23.4	336.7	-0.3	34		17	3.5	-4.4	343.9	19.7	-1.5	70
	19	6.6	6.3	20.9	1.1	-0.4	56		19	0.9	-6.0	338.6	44.0	-1.4	85
	21	6.7	4.5	13.6	25.5	-0.5	77		21	-1.5	-6.6	336.5	68.4	-1.4	96
	23	5.7	1.8	3.4	49.9	-0.5	91		23	-3.3	-6.0	338.2	92.7	-1.4	100
	25	3.8	-1.0	353.1	74.3	-0.6	99		25	-4.6	-4.4	344.2	117.0	-1.4	96
	27	1.4	-3.6	344.7	98.7	-0.6	99		27	-5.3	-1.8	354.0	141.3	-1.4	85
	29	-1.2	-5.6	339.1	123.1	-0.7	92		29	-5.2	1.3	5.3	165.6	-1.3	67
	31	-3.8	-6.7	336.7	147.5	-0.7	79		31	-4.1	4.2	15.2	189.9	-1.3	45
Aug	2	-5.9	-6.6	337.8	171.9	-0.8	62	Nov	2	-1.8	6.1	21.7	214.3	-1.3	23
Ago	4	-7.2	-5.2	343.3	196.4	-0.8	42		4	1.2	6.6	23.4	238.7	-1.2	7
	6	-7.1	-2.7	353.0	220.8	-0.8	22		6	4.2	5.4	19.5	263.1	-1.2	0
	8	-5.2	0.6	5.1	245.3	-0.9	7		8	6.1	2.9	10.4	287.5	-1.2	4
	10	-1.8	3.8	15.7	269.8	-0.9	0		10	6.3	-0.1	359.1	311.9	-1.1	17
	12	2.3	6.0	22.1	294.3	-1.0	5		12	4.9	-3.0	349.1	336.3	-1.1	34
	14	5.7	6.7	23.1	318.8	-1.0	21		14	2.6	-5.2	341.8	0.6	-1.1	53
	16	7.6	5.7	18.7	343.3	-1.1	42		16	0.0	-6.5	337.5	25.0	-1.0	71
	18	7.7	3.4	9.9	7.7	-1.1	63		18	-2.2	-6.6	336.6	49.3	-1.0	87
	20	6.3	0.6	359.3	32.1	-1.1	81		20	-3.9	-5.6	339.7	73.6	-0.9	97
	22	4.1	-2.2	349.6	56.5	-1.2	94		22	-4.6	-3.4	347.3	97.8	-0.9	100
	24	1.4	-4.5	342.2	80.9	-1.2	100		24	-4.5	-0.5	358.1	122.1	-0.8	94
	26	-1.2	-6.0	337.8	105.2	-1.2	98		26	-3.7	2.6	9.4	146.4	-0.8	80
	28	-3.7	-6.6	336.6	129.6	-1.3	90		28	-2.2	5.3	18.2	170.7	-0.7	60
	30	-5.8	-6.1	339.3	154.0	-1.3	76		30	-0.1	6.6	23.0	195.0	-0.7	37
Sep	1	-7.1	-4.3	346.2	178.4	-1.3	58	Dec	2	2.1	6.4	22.8	219.4	-0.6	17
Set	3	-7.3	-1.5	356.8	202.8	-1.4	37	Dic	4	4.2	4.7	17.1	243.8	-0.6	4
	5	-5.7	1.7	8.4	227.3	-1.4	17		6	5.3	1.9	7.0	268.2	-0.5	0
	7	-2.5	4.6	17.9	251.7	-1.4	3		8	5.2	-1.2	355.8	292.5	-0.5	6
	9	1.7	6.3	22.9	276.2	-1.4	0		10	3.8	-3.9	346.4	316.9	-0.4	18
	11	5.5	6.4	22.4	300.7	-1.4	10		12	1.6	-5.9	340.0	341.3	-0.4	35
	13	7.7	4.8	16.2	325.1	-1.5	27		14	-1.0	-6.8	336.8	5.6	-0.3	54
	15	7.8	2.2	6.1	349.5	-1.5	48		16	-3.3	-6.5	337.1	29.9	-0.2	72
	17	6.4	-0.7	355.5	13.9	-1.5	67		18	-4.9	-5.0	341.6	54.2	-0.2	88
	19	4.0	-3.3	346.5	38.3	-1.5	84		20	-5.3	-2.5	350.4	78.4	-0.1	98
	21	1.4	-5.3	340.2	62.7	-1.5	95		22	-4.5	0.7	2.0	102.7	-0.1	99
	23	-1.1	-6.4	336.9	87.0	-1.5	100		24	-2.7	3.8	13.0	127.0	0.0	91
	25	-3.3	-6.4	337.2	111.3	-1.5	98		26	-0.3	6.0	20.5	151.2	0.0	74
	27	-5.1	-5.3	341.5	135.7	-1.5	88		28	1.9	6.8	23.6	175.5	0.1	52
	29	-6.3	-3.1	349.9	160.0	-1.5	72		30	3.7	5.9	21.4	199.9	0.2	30

#### Legenda:

l = librazione in longitudine, in °  
 b = librazione in latitudine, in °  
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 coln = colongitudine del Sole, ossia longitudine del terminatore lunare, in °  
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 ill = percentuale di Luna illuminata

l = libration in longitude, in °  
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 axis = angle of position from the lunar north pole, in °  
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 lat = latitude of the Sun, referred to the lunar equator, in °  
 ill = lunar lightning

# FENOMENI LUNARI - LUNAR PHENOMENA

Perigei - Perigea					Apogei - Apogea				
Jan 1	20:37	358682 km	F+1d 1h		Jan 17	1:41	406433 km	-	N+1d18h
Jan 30	9:04	356592 km	++ F+ 2h		Feb 13	2:07	406541 km	--	N-1d 0h
Feb 27	21:41	357831 km	F- 18h		Mar 12	10:08	406009 km		N-3d10h
Mar 28	4:57	361876 km	F-1d21h		Apr 9	2:46	404997 km		N-5d 9h
Apr 24	21:00	367141 km	F-3d15h		May 6	21:54	404230 km		N-7d 3h
May 20	8:40	369728 km	N+6d 7h		Jun 3	16:52	404264 km		F+6d17h
Jun 15	14:55	365936 km	N+3d 3h		Jul 1	10:13	405035 km		F+4d22h
Jul 13	11:22	361114 km	N+1d15h		Jul 28	23:51	405954 km		F+2d22h
Aug 10	17:57	357857 km	N+ 14h		Aug 25	5:52	406389 km	+	F+ 12h
Sep 8	4:02	357191 km	N- 6h		Sep 21	8:04	406167 km	+	F-2d 1h
Oct 6	13:42	359452 km	N-1d 5h		Oct 18	18:19	405432 km		F-4d 7h
Nov 3	17:23	364188 km	N-2d11h		Nov 15	11:48	404633 km		F-6d 5h
Nov 30	19:10	369438 km	N-4d22h		Dec 13	8:36	404407 km		N+7d14h
					Dec 25	12:25	368462 km		F+4d 4h

Tutti gli orari sono in T.U., le distanze sono calcolate da centro Luna a centro Terra; F indica che il fenomeno avviene in prossimità della luna piena, N che avviene in prossimità della luna nuova, "-" o "+" indicano di quanti giorni ed ore il perigeo o l'apogeo precedono la fase lunare.

Jan=gennaio, May=maggio, Jun=giugno, Jul=luglio, Aug=agosto, Sep=settembre, Oct=ottobre, Dec=dicembre

All the scheduled times are in U.T., the distances are calculated from the center of the Moon to the center of the Earth; F means that the phenomenon happens in proximity of the full moon, N that happens in proximity of the new moon, "-" or "+" shows how many days and hour the lunar phase precedes or follows the perigeum or the apogeeum.

## Passage through node

01/01/2010	12.29.10	06/04/2010	09.43.23	11/07/2010	07.30.42	13/10/2010	15.34.26
14/01/2010	23.17.17	20/04/2010	13.38.13	24/07/2010	07.57.40	28/10/2010	03.15.10
29/01/2010	00.02.48	03/05/2010	12.33.42	07/08/2010	17.23.21	09/11/2010	20.13.28
11/02/2010	04.57.17	17/05/2010	15.38.29	20/08/2010	12.11.31	24/11/2010	06.26.52
25/02/2010	09.11.19	30/05/2010	18.07.02	04/09/2010	00.14.18	07/12/2010	04.14.04
10/03/2010	08.06.40	13/06/2010	21.54.37	16/09/2010	13.55.42	21/12/2010	14.08.17
24/03/2010	13.05.34	27/06/2010	01.19.50	01/10/2010	02.41.26		

## Maximal libration

08/01/2010	12.31.29	7.2 °	27/05/2010	21.58.01	5.1 °	30/09/2010	06.57.06	-6.6 °
05/02/2010	14.35.23	7.8 °	09/06/2010	15.15.30	-5.7 °	12/10/2010	06.08.37	7.5 °
21/02/2010	12.21.54	-7.4 °	23/06/2010	09.11.36	5.5 °	27/10/2010	18.26.20	-5.4 °
05/03/2010	20.36.24	7.6 °	07/07/2010	14.19.06	-6.6 °	09/11/2010	06.17.33	6.4 °
21/03/2010	07.47.36	-6.3 °	20/07/2010	07.12.01	6.7 °	22/11/2010	20.03.58	-4.6 °
02/04/2010	23.29.30	6.6 °	04/08/2010	20.10.17	-7.2 °	06/12/2010	20.11.26	5.4 °
16/04/2010	18.24.03	-5.1 °	17/08/2010	00.36.55	7.7 °	19/12/2010	15.21.43	-5.1 °
30/04/2010	17.59.40	5.6 °	02/09/2010	03.19.46	-7.3 °			
13/05/2010	04.46.33	-5.0 °	14/09/2010	02.27.00	8.0 °			

Passage through node = passaggio al nodo, tempi in T.U.  
Maximal libration = librazione massima, times in U.T.

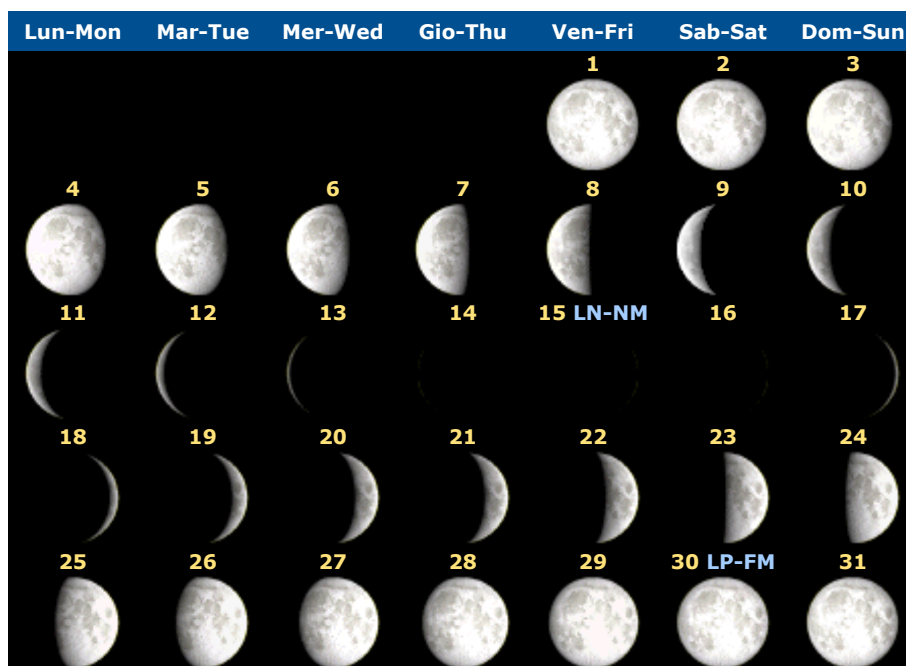
© (5)

# FASI LUNARI - LUNAR PHASES

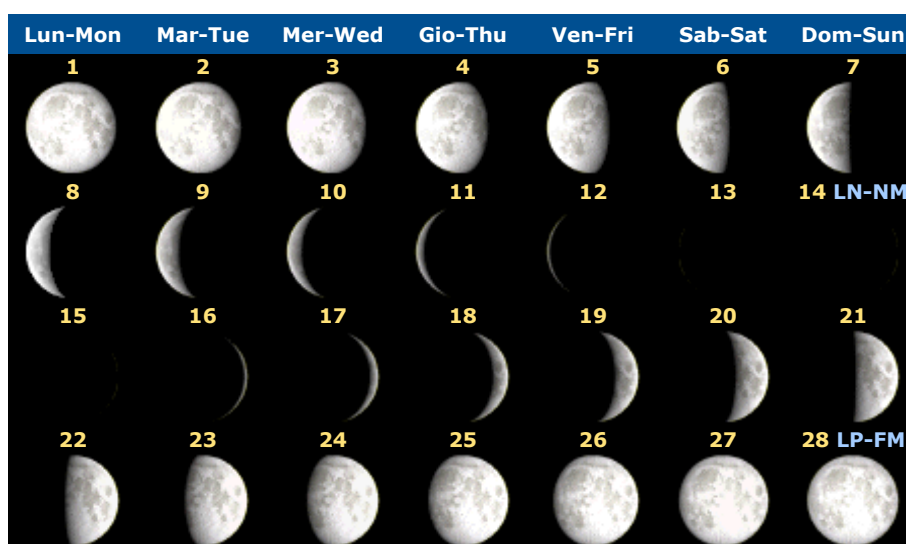
LUNA NUOVA NEW MOON			PRIMO QUARTO FIRST QUARTER			LUNA PIENA FULL MOON			ULTIMO QUARTO LAST QUARTER		
d	h	m	d	h	m	d	h	m	d	h	m
JAN.	15	7 11	JAN.	23	10 53	JAN.	30	6 18	JAN.	7	10 39
FEB.	14	2 51	FEB.	22	0 42	FEB.	28	16 38	FEB.	5	23 48
MAR.	15	21 01	MAR.	23	11 00	MAR.	30	2 25	MAR.	7	15 42
APR.	14	12 29	APR.	21	18 20	APR.	28	12 18	APR.	6	9 37
MAY	14	1 04	MAY	20	23 43	MAY	27	23 07	MAY	6	4 15
JUNE	12	11 15	JUNE	19	4 29	JUNE	26	11 30	JUNE	4	22 13
JULY	11	19 40	JULY	18	10 11	JULY	26	1 37	JULY	4	14 35
AUG.	10	3 08	AUG.	16	18 14	AUG.	24	17 05	AUG.	3	4 59
SEPT.	8	10 30	SEPT.	15	5 50	SEPT.	23	9 17	SEPT.	1	17 22
OCT.	7	18 44	OCT.	14	21 27	OCT.	23	1 36	OCT.	1	3 52
NOV.	6	4 52	NOV.	13	16 39	NOV.	21	17 27	OCT.	30	12 46
DEC.	5	17 36	DEC.	13	13 59	NOV.	21	17 27	NOV.	28	20 36
						DEC.	21	8 13	DEC.	28	4 18

Jan=Gen, May=Mag, Jun=Giu, Jul=Lug, Aug=Ago, Sept=Set, Oct=Ott, Dec=Dic

## Gennaio - January

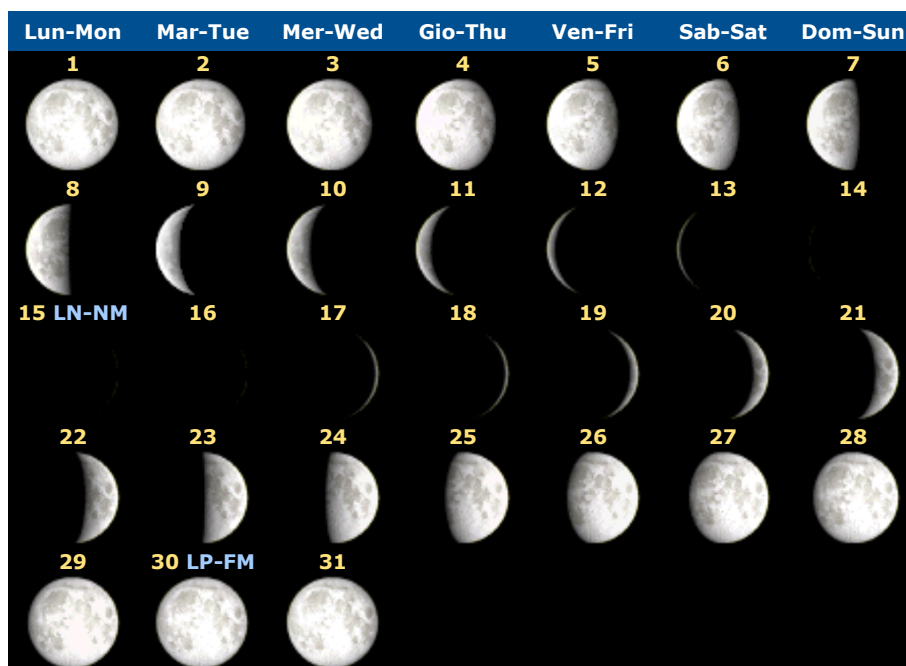


## Febbraio - February





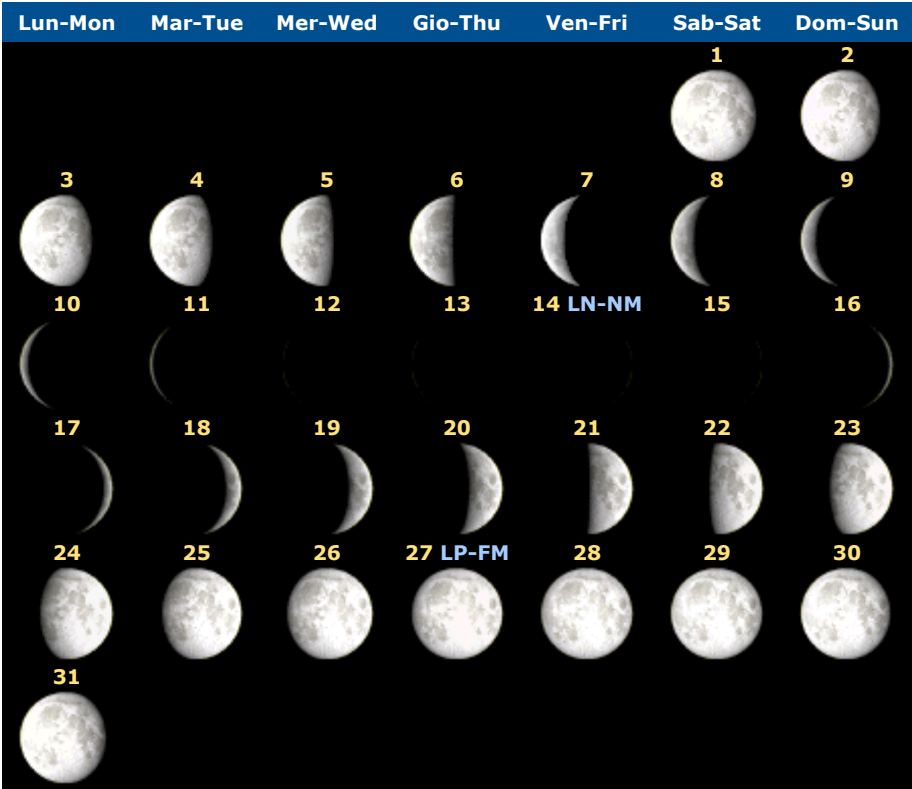
## Marzo - March



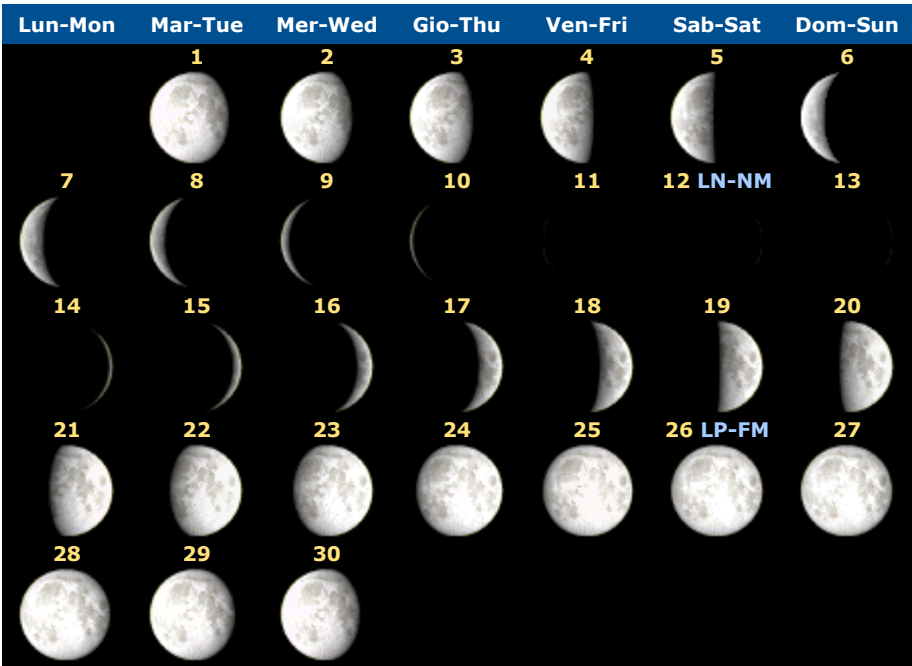
## Aprile - April



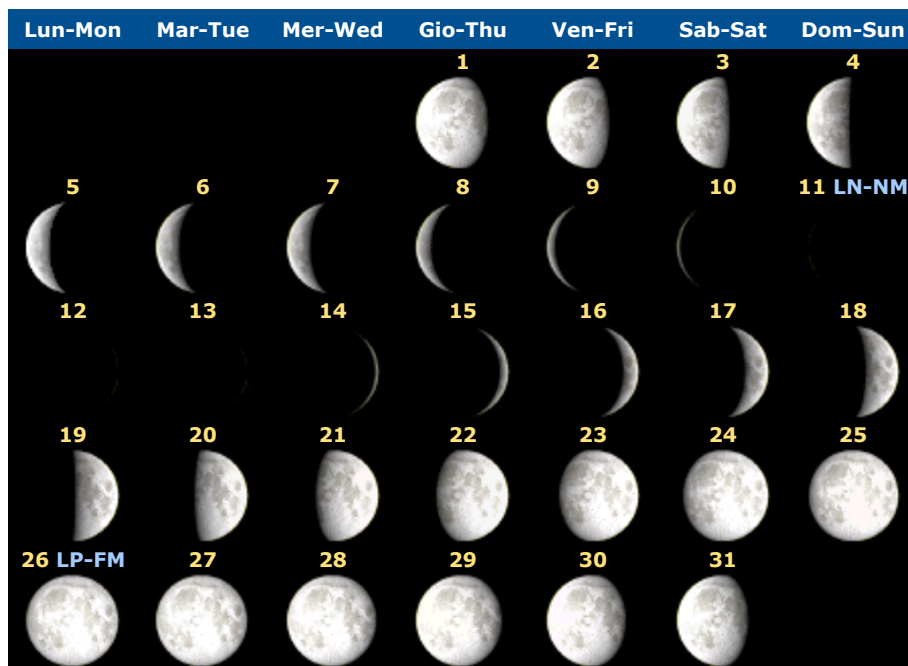
Maggio - May



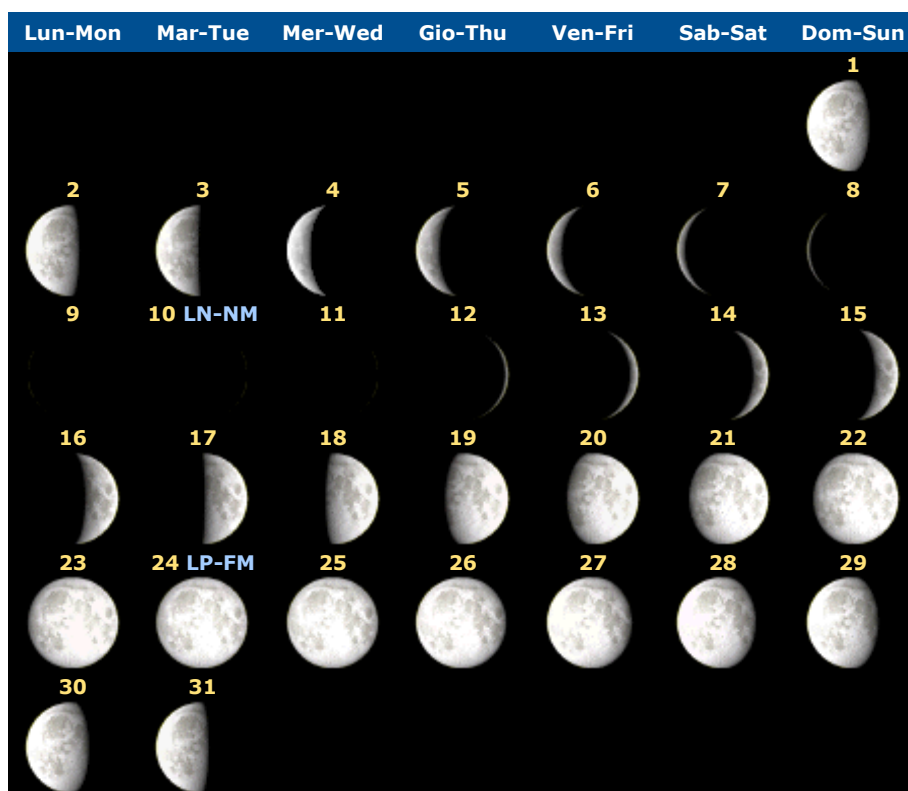
Giugno - June



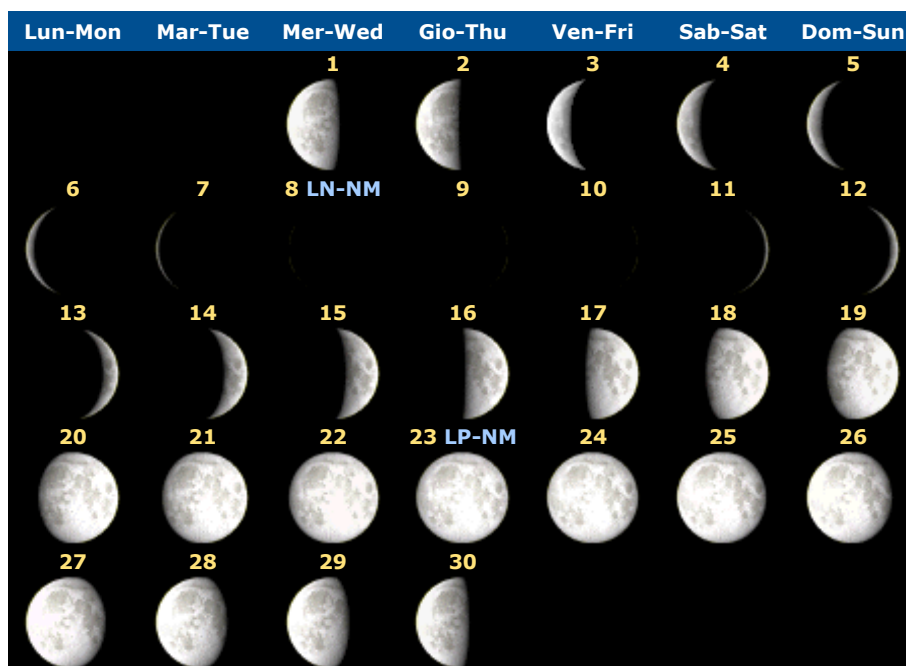
## Luglio - July



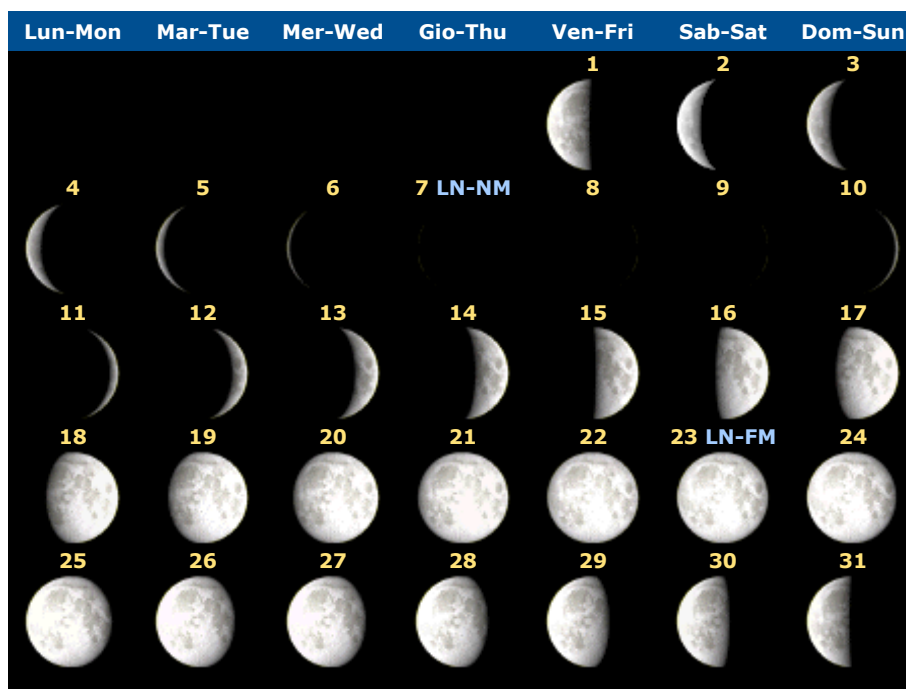
## Agosto- August



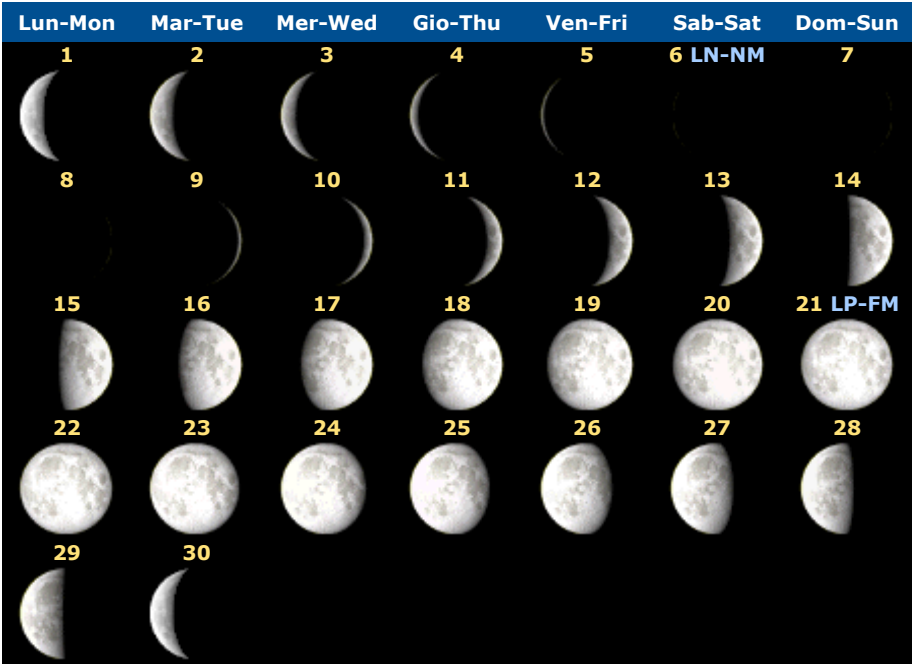
## Settembre- September



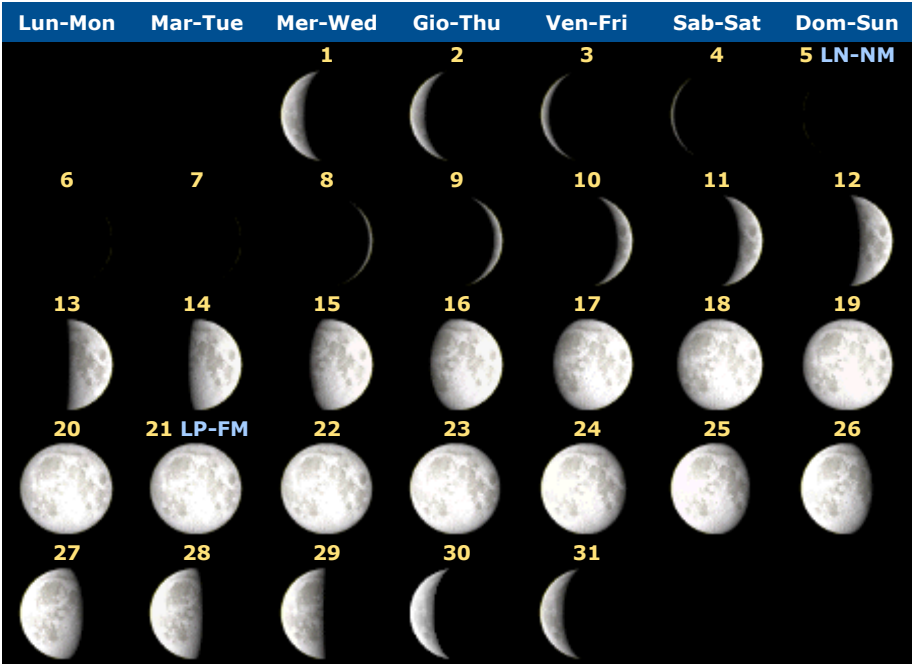
## Ottobre - October



Novembre - November



Dicembre - December



# LEVATA E TRAMONTO DELLA LUNA

## RISING AND SETTING OF THE MOON

for Greenwich Meridian      for Rome :      Longitude E 12 00.0  
 Latitude N 42 00.0  
 Time Zone      UT +1

		Ephemeris		Transit													
Date		TDT JD		TDT Time		Rise	(Azm)	Trans	(Alt)	Set	(Azm)						
				h	m	s		h	m			h	m				
2010-01-	1	2455197.511344		0	16	20.1		p16	31 ( 56)			0	26 (72)			8	12 (301)
2010-01-	2	2455198.554226		1	18	05.1		p17	49 ( 61)			1	28 (68)			8	54 (295)
2010-01-	3	2455199.594377		2	15	54.2		p19	10 ( 68)			2	26 (63)			9	28 (287)
2010-01-	4	2455200.631749		3	09	43.1		p20	29 ( 76)			3	20 (56)			9	57 (279)
2010-01-	5	2455201.666927		4	00	22.5		p21	45 ( 85)			4	11 (50)			10	24 (270)
2010-01-	6	2455202.700757		4	49	05.4		p22	59 ( 94)			4	59 (44)			10	49 (262)
2010-01-	7	2455203.734100		5	37	06.2		0	10 (102)			5	48 (38)			11	15 (254)
2010-01-	8	2455204.767693		6	25	28.7		1	20 (110)			6	36 (32)			11	43 (247)
2010-01-	9	2455205.802052		7	14	57.3		2	29 (116)			7	25 (28)			12	15 (242)
2010-01-	10	2455206.837372		8	05	49.0		3	35 (121)			8	16 (25)			12	52 (237)
2010-01-	11	2455207.873462		8	57	47.1		4	38 (125)			9	08 (23)			13	36 (235)
2010-01-	12	2455208.909766		9	50	03.8		5	35 (126)			10	00 (22)			14	26 (234)
2010-01-	13	2455209.945529		10	41	33.7		6	24 (125)			10	52 (23)			15	22 (235)
2010-01-	14	2455210.980050		11	31	16.3		7	06 (123)			11	42 (25)			16	22 (239)
2010-01-	15	2455212.012894		12	18	34.0		7	41 (119)			12	29 (28)			17	23 (243)
2010-01-	16	2455213.043973		13	03	19.3		8	10 (114)			13	14 (32)			18	25 (249)
2010-01-	17	2455214.073507		13	45	51.0		8	35 (107)			13	56 (36)			19	26 (255)
2010-01-	18	2455215.101932		14	26	46.9		8	58 (101)			14	37 (41)			20	26 (262)
2010-01-	19	2455216.129823		15	06	56.7		9	19 ( 94)			15	18 (46)			21	26 (270)
2010-01-	20	2455217.157846		15	47	17.9		9	40 ( 87)			15	58 (52)			22	27 (277)
2010-01-	21	2455218.186734		16	28	53.8		10	01 ( 80)			16	40 (57)			23	29 (284)
2010-01-	22	2455219.217268		17	12	52.0		10	25 ( 73)			17	23 (62)	f	0	33 (291)	
2010-01-	23	2455220.250228		18	00	19.7		10	52 ( 67)			18	11 (67)	f	1	41 (297)	
2010-01-	24	2455221.286259		18	52	12.7		11	25 ( 61)			19	02 (70)	f	2	50 (302)	
2010-01-	25	2455222.325619		19	48	53.5		12	06 ( 57)			19	59 (73)	f	3	58 (305)	
2010-01-	26	2455223.367866		20	49	43.6		12	58 ( 55)			21	00 (74)	f	5	02 (306)	
2010-01-	27	2455224.411717		21	52	52.3		14	02 ( 55)			22	03 (73)	f	5	57 (303)	
2010-01-	28	2455225.455415		22	55	47.9		15	17 ( 58)			23	06 (70)	f	6	44 (298)	
2010-01-	29	2455226.497471		23	56	21.5		16	37 ( 64)	f	0	06 (66)		f	7	22 (292)	
2010-01-	31	2455227.537186		0	53	32.9		p17	59 ( 72)			1	04 (60)			7	54 (283)
2010-02-	1	2455228.574661		1	47	30.7		p19	19 ( 81)			1	58 (53)			8	23 (275)
2010-02-	2	2455229.610485		2	39	05.9		p20	37 ( 90)			2	49 (47)			8	50 (266)
2010-02-	3	2455230.645417		3	29	24.0		p21	52 ( 99)			3	40 (40)			9	17 (257)
2010-02-	4	2455231.680179		4	19	27.4		p23	05 (107)			4	30 (34)			9	45 (250)
2010-02-	5	2455232.715311		5	10	02.9		0	17 (114)			5	20 (30)			10	16 (244)
2010-02-	6	2455233.751072		6	01	32.6		1	26 (120)			6	12 (26)			10	52 (239)
2010-02-	7	2455234.787374		6	53	49.1		2	31 (124)			7	04 (23)			11	34 (235)
2010-02-	8	2455235.823795		7	46	15.9		3	30 (126)			7	57 (22)			12	22 (234)
2010-02-	9	2455236.859707		8	37	58.6		4	22 (126)			8	48 (23)			13	16 (235)
2010-02-	10	2455237.894488		9	28	03.7		5	06 (124)			9	38 (24)			14	15 (237)
2010-02-	11	2455238.927716		10	15	54.6		5	43 (120)			10	26 (27)			15	16 (242)
2010-02-	12	2455239.959261		11	01	20.1		6	13 (115)			11	12 (30)			16	17 (247)
2010-02-	13	2455240.989271		11	44	33.0		6	40 (110)			11	55 (35)			17	18 (253)
2010-02-	14	2455242.018103		12	26	04.1		7	03 (103)			12	37 (39)			18	19 (260)
2010-02-	15	2455243.046248		13	06	35.8		7	25 ( 96)			13	17 (45)			19	19 (267)
2010-02-	16	2455244.074285		13	46	58.2		7	46 ( 89)			13	58 (50)			20	20 (274)
2010-02-	17	2455245.102848		14	28	06.1		8	07 ( 82)			14	39 (55)			21	21 (282)
2010-02-	18	2455246.132608		15	10	57.4		8	30 ( 75)			15	22 (60)			22	24 (288)
2010-02-	19	2455247.164236		15	56	30.0		8	56 ( 69)			16	07 (65)			23	29 (295)
2010-02-	20	2455248.198319		16	45	34.8		9	26 ( 63)			16	56 (69)	f	0	36 (300)	
2010-02-	21	2455249.235207		17	38	41.9		10	03 ( 58)			17	49 (72)	f	1	43 (304)	
2010-02-	22	2455250.274790		18	35	41.9		10	48 ( 55)			18	46 (73)	f	2	46 (305)	
2010-02-	23	2455251.316341		19	35	31.8		11	45 ( 55)			19	46 (73)	f	3	43 (305)	
2010-02-	24	2455252.358615		20	36	24.3		12	52 ( 56)			20	46 (72)	f	4	33 (301)	
2010-02-	25	2455253.400292		21	36	25.2		14	07 ( 61)			21	46 (68)	f	5	14 (295)	
2010-02-	26	2455254.440477		22	34	17.2		15	26 ( 68)			22	44 (63)	f	5	49 (288)	
2010-02-	27	2455255.478925		23	29	39.2		16	47 ( 76)			23	40 (57)	f	6	19 (280)	
2010-03-	1	2455256.515932		0	22	56.5		p18	06 ( 85)			0	33 (50)			6	48 (271)
2010-03-	2	2455257.552083		1	15	00.0		p19	24 ( 94)			1	25 (44)			7	15 (262)
2010-03-	3	2455258.588026		2	06	45.5		p20	40 (103)			2	17 (37)			7	43 (254)
2010-03-	4	2455259.624284		2	58	58.1		p21	55 (111)			3	09 (32)			8	15 (246)
2010-03-	5	2455260.661117		3	52	00.5		p23	08 (117)			4	02 (27)			8	50 (241)
2010-03-	6	2455261.698436		4	45	44.9		0	17 (122)			4	56 (24)			9	30 (237)
2010-03-	7	2455262.735807		5	39	33.7		1	20 (125)			5	50 (23)			10	17 (235)
2010-03-	8	2455263.772580		6	32	30.9		2	16 (126)			6	43 (23)			11	10 (235)
2010-03-	9	2455264.808115		7	23	41.2		3	03 (124)			7	34 (24)			12	08 (237)
2010-03-	10	2455265.841987		8	12	27.7		3	43 (121)			8	23 (26)			13	08 (240)
2010-03-	11	2455266.874073		8	58	39.9		4	15 (117)			9	09 (29)			14	09 (245)
2010-03-	12	2455267.904533		9	42	31.6		4	43 (111)			9	53 (33)			15	10 (251)
2010-03-	13	2455268.933731		10	24	34.3		5	08 (105)			10	35 (38)			16	11 (258)
2010-03-	14	2455269.962158		11	05	30.5		5	30 ( 99)			11	16 (43)			17	11 (265)
2010-03-	15	2455270.990378		11	46	08.7		5	52 ( 92)			11	57 (48)			18	12 (272)

Date	TDT JD	TDT Time	Rise	(Azm)	Trans	(Alt)	Set	(Azm)
		h m s	h m	°	h m	°	h m	°
2010-03-16	2455272.018997	12 27 21.3	6 13	( 85)	12 38	(53)	19 14	(279)
2010-03-17	2455273.048635	13 10 02.0	6 36	( 78)	13 21	(59)	20 17	(286)
2010-03-18	2455274.079898	13 55 03.2	7 01	( 71)	14 06	(63)	21 22	(293)
2010-03-19	2455275.113301	14 43 09.2	7 30	( 65)	14 54	(68)	22 28	(298)
2010-03-20	2455276.149146	15 34 46.2	8 04	( 60)	15 45	(71)	23 34	(303)
2010-03-21	2455277.187350	16 29 47.1	8 47	( 56)	16 40	(73)	f 0 38	(305)
2010-03-22	2455278.227330	17 27 21.3	9 38	( 55)	17 37	(73)	f 1 36	(305)
2010-03-23	2455279.268078	18 26 01.9	10 40	( 56)	18 36	(72)	f 2 26	(302)
2010-03-24	2455280.308483	19 24 13.0	11 50	( 59)	19 34	(70)	f 3 09	(298)
2010-03-25	2455281.347741	20 20 44.8	13 04	( 65)	20 31	(65)	f 3 45	(291)
2010-03-26	2455282.385570	21 15 13.2	14 21	( 72)	21 25	(60)	f 4 16	(284)
2010-03-27	2455283.422181	22 07 56.5	15 38	( 80)	22 18	(54)	f 4 45	(275)
2010-03-28	2455284.458101	22 59 40.0	16 55	( 89)	23 10	(47)	f 5 12	(266)
2010-03-29	2455285.493970	23 51 19.0	18 12	( 98)	f 0 02	(41)	f 5 40	(258)
2010-03-31	2455286.530363	0 43 43.4	p19 28	(107)	0 54	(35)	6 11	(250)
2010-04- 1	2455287.567624	1 37 22.7	p20 43	(114)	1 48	(30)	6 44	(244)
2010-04- 2	2455288.605727	2 32 14.8	p21 56	(120)	2 42	(26)	7 24	(239)
2010-04- 3	2455289.644222	3 27 40.8	p23 04	(124)	3 38	(24)	8 09	(236)
2010-04- 4	2455290.682337	4 22 33.9	0 04	(125)	4 33	(23)	9 01	(235)
2010-04- 5	2455291.719243	5 15 42.6	0 56	(125)	5 26	(23)	9 58	(236)
2010-04- 6	2455292.754340	6 06 15.0	1 39	(122)	6 17	(25)	10 58	(239)
2010-04- 7	2455293.787400	6 53 51.4	2 15	(118)	7 04	(28)	11 59	(244)
2010-04- 8	2455294.818553	7 38 43.0	2 45	(113)	7 49	(32)	13 01	(249)
2010-04- 9	2455295.848185	8 21 23.2	3 11	(107)	8 32	(36)	14 01	(255)
2010-04-10	2455296.876832	9 02 38.3	3 34	(101)	9 13	(41)	15 02	(262)
2010-04-11	2455297.905104	9 43 21.0	3 56	( 94)	9 54	(46)	16 02	(269)
2010-04-12	2455298.933650	10 24 27.4	4 17	( 87)	10 35	(52)	17 03	(277)
2010-04-13	2455299.963130	11 06 54.4	4 40	( 80)	11 17	(57)	18 06	(284)
2010-04-14	2455300.994181	11 51 37.2	5 04	( 73)	12 02	(62)	19 11	(290)
2010-04-15	2455302.027352	12 39 23.2	5 32	( 67)	12 50	(66)	20 18	(296)
2010-04-16	2455303.062971	13 30 40.7	6 06	( 62)	13 41	(70)	21 25	(301)
2010-04-17	2455304.100974	14 25 24.1	6 46	( 58)	14 36	(72)	22 30	(304)
2010-04-18	2455305.140767	15 22 42.3	7 36	( 55)	15 33	(73)	23 31	(305)
2010-04-19	2455306.181298	16 21 04.2	8 35	( 56)	16 31	(73)	f 0 23	(303)
2010-04-20	2455307.221394	17 18 48.5	9 41	( 58)	17 29	(70)	f 1 07	(299)
2010-04-21	2455308.260189	18 14 40.3	10 53	( 63)	18 25	(67)	f 1 45	(293)
2010-04-22	2455309.297368	19 08 12.6	12 08	( 70)	19 18	(62)	f 2 17	(286)
2010-04-23	2455310.333138	19 59 43.1	13 22	( 77)	20 10	(56)	f 2 45	(278)
2010-04-24	2455311.368051	20 49 59.6	14 36	( 86)	21 00	(50)	f 3 12	(270)
2010-04-25	2455312.402812	21 40 03.0	15 50	( 94)	21 50	(43)	f 3 39	(262)
2010-04-26	2455313.438115	22 30 53.1	17 05	(103)	22 41	(37)	f 4 08	(254)
2010-04-27	2455314.474488	23 23 15.8	18 19	(110)	23 34	(32)	f 4 40	(247)
2010-04-29	2455315.512133	0 17 28.3	p19 33	(117)	0 28	(28)	5 16	(241)
2010-04-30	2455316.550783	1 13 07.6	p20 43	(122)	1 23	(25)	5 59	(237)
2010-05- 1	2455317.589701	2 09 10.2	p21 48	(124)	2 19	(23)	6 49	(235)
2010-05- 2	2455318.627893	3 04 10.0	p22 45	(125)	3 14	(23)	7 45	(236)
2010-05- 3	2455319.664461	3 56 49.5	p23 32	(123)	4 07	(24)	8 45	(238)
2010-05- 4	2455320.698891	4 46 24.2	0 12	(120)	4 57	(27)	9 47	(242)
2010-05- 5	2455321.731127	5 32 49.4	0 44	(115)	5 43	(30)	10 49	(247)
2010-05- 6	2455322.761475	6 16 31.4	1 12	(110)	6 27	(35)	11 50	(253)
2010-05- 7	2455323.790464	6 58 16.1	1 36	(103)	7 09	(39)	12 50	(260)
2010-05- 8	2455324.818739	7 38 59.0	1 58	( 97)	7 50	(44)	13 50	(267)
2010-05- 9	2455325.846998	8 19 40.6	2 20	( 90)	8 30	(50)	14 51	(274)
2010-05-10	2455326.875966	9 01 23.4	2 42	( 83)	9 12	(55)	15 53	(281)
2010-05-11	2455327.906366	9 45 10.0	3 06	( 76)	9 56	(60)	16 57	(288)
2010-05-12	2455328.938870	10 31 58.4	3 32	( 69)	10 42	(65)	18 03	(294)
2010-05-13	2455329.973975	11 22 31.4	4 04	( 64)	11 33	(69)	19 11	(299)
2010-05-14	2455331.011808	12 17 00.2	4 43	( 59)	12 27	(71)	20 19	(303)
2010-05-15	2455332.051913	13 14 45.2	5 30	( 56)	13 25	(73)	21 22	(305)
2010-05-16	2455333.093208	14 14 13.2	6 27	( 56)	14 24	(73)	22 18	(304)
2010-05-17	2455334.134296	15 13 23.2	7 33	( 57)	15 23	(71)	23 06	(300)
2010-05-18	2455335.174001	16 10 33.7	8 45	( 62)	16 21	(68)	23 46	(295)
2010-05-19	2455336.211754	17 04 55.6	9 59	( 68)	17 15	(63)	f 0 19	(288)
2010-05-20	2455337.247635	17 56 35.7	11 13	( 75)	18 07	(58)	f 0 48	(281)
2010-05-21	2455338.282170	18 46 19.5	12 26	( 83)	18 57	(52)	f 1 15	(272)
2010-05-22	2455339.316103	19 35 11.3	13 38	( 92)	19 46	(45)	f 1 42	(264)
2010-05-23	2455340.350220	20 24 19.0	14 51	(100)	20 35	(39)	f 2 09	(256)
2010-05-24	2455341.385208	21 14 41.9	16 03	(108)	21 25	(34)	f 2 38	(249)
2010-05-25	2455342.421510	22 06 58.5	17 15	(115)	22 17	(29)	f 3 12	(243)
2010-05-26	2455343.459170	23 01 12.3	18 26	(120)	23 11	(26)	f 3 52	(238)
2010-05-27	2455344.497725	23 56 43.4	19 32	(123)	f 0 07	(24)	f 4 39	(236)
2010-05-29	2455345.536277	0 52 14.3	p20 33	(125)	1 02	(23)	5 32	(235)
2010-05-30	2455346.573785	1 46 15.0	p21 24	(124)	1 56	(24)	6 31	(237)
2010-05-31	2455347.609436	2 37 35.3	p22 07	(121)	2 48	(26)	7 33	(240)
2010-06- 1	2455348.642868	3 25 43.8	p22 42	(117)	3 36	(29)	8 36	(245)
2010-06- 2	2455349.674167	4 10 48.0	p23 12	(112)	4 21	(33)	9 38	(251)
2010-06- 3	2455350.703744	4 53 23.5	p23 38	(106)	5 04	(38)	10 38	(257)
2010-06- 4	2455351.732196	5 34 21.8	0 01	( 99)	5 45	(42)	11 38	(264)
2010-06- 5	2455352.760212	6 14 42.3	0 22	( 92)	6 25	(48)	12 38	(271)
2010-06- 6	2455353.788529	6 55 28.9	0 44	( 86)	7 06	(53)	13 39	(278)
2010-06- 7	2455354.817915	7 37 47.9	1 06	( 79)	7 48	(58)	14 41	(285)
2010-06- 8	2455355.849135	8 22 45.3	1 32	( 72)	8 33	(63)	15 46	(292)
2010-06- 9	2455356.882870	9 11 20.0	2 01	( 66)	9 22	(67)	16 53	(297)



Date	TDT JD	TDT Time	Rise (AzM)	Trans (Alt)	Set (AzM)
		h m s	h m °	h m °	h m °
2010-06-10	2455357.919557	10 04 09.7	2 36 ( 61)	10 14 (70)	18 01 (302)
2010-06-11	2455358.959125	11 01 08.4	3 20 ( 57)	11 11 (72)	19 07 (304)
2010-06-12	2455360.000788	12 01 08.1	4 13 ( 55)	12 11 (73)	20 08 (304)
2010-06-13	2455361.043129	13 02 06.3	5 17 ( 56)	13 12 (72)	21 00 (302)
2010-06-14	2455362.084607	14 01 50.0	6 29 ( 60)	14 12 (69)	21 44 (297)
2010-06-15	2455363.124172	14 58 48.5	7 45 ( 66)	15 09 (65)	22 20 (290)
2010-06-16	2455364.161529	15 52 36.1	9 01 ( 73)	16 03 (59)	22 51 (283)
2010-06-17	2455365.197009	16 43 41.6	10 16 ( 81)	16 54 (53)	23 19 (275)
2010-06-18	2455366.231301	17 33 04.4	11 30 ( 89)	17 43 (47)	23 46 (267)
2010-06-19	2455367.265209	18 21 54.0	12 42 ( 98)	18 32 (41)	f 0 12 (259)
2010-06-20	2455368.299497	19 11 16.5	13 53 (106)	19 22 (35)	f 0 41 (251)
2010-06-21	2455369.334755	20 02 02.8	15 04 (113)	20 12 (31)	f 1 13 (245)
2010-06-22	2455370.371259	20 54 36.7	16 14 (118)	21 05 (27)	f 1 50 (240)
2010-06-23	2455371.408849	21 48 44.5	17 22 (123)	21 59 (24)	f 2 33 (236)
2010-06-24	2455372.446903	22 43 32.4	18 23 (125)	22 54 (23)	f 3 23 (235)
2010-06-25	2455373.484497	23 37 40.6	19 17 (125)	23 48 (23)	f 4 20 (236)
2010-06-27	2455374.520728	0 29 50.9	p20 03 (122)	0 40 (25)	5 21 (239)
2010-06-28	2455375.555006	1 19 12.5	p20 41 (119)	1 30 (28)	6 23 (243)
2010-06-29	2455376.587173	2 05 31.8	p21 13 (114)	2 16 (31)	7 26 (248)
2010-06-30	2455377.617448	2 49 07.5	p21 40 (108)	3 00 (36)	8 27 (255)
2010-07- 1	2455378.646295	3 30 39.9	p22 04 (102)	3 41 (41)	9 27 (261)
2010-07- 2	2455379.674324	4 11 01.6	p22 26 ( 95)	4 22 (46)	10 27 (268)
2010-07- 3	2455380.702216	4 51 11.5	p22 47 ( 88)	5 02 (51)	11 26 (275)
2010-07- 4	2455381.730702	5 32 12.6	p23 09 ( 81)	5 43 (56)	12 27 (282)
2010-07- 5	2455382.760538	6 15 10.5	p23 32 ( 75)	6 26 (61)	13 30 (289)
2010-07- 6	2455383.792469	7 01 09.3	p23 59 ( 68)	7 12 (65)	14 35 (295)
2010-07- 7	2455384.827126	7 51 03.7	0 31 ( 63)	8 01 (69)	15 41 (300)
2010-07- 8	2455385.864830	8 45 21.3	1 10 ( 59)	8 56 (72)	16 48 (303)
2010-07- 9	2455386.905328	9 43 40.3	1 58 ( 56)	9 54 (73)	17 51 (305)
2010-07-10	2455387.947632	10 44 35.4	2 57 ( 56)	10 55 (73)	18 48 (303)
2010-07-11	2455388.990236	11 45 56.4	4 06 ( 58)	11 56 (71)	19 37 (299)
2010-07-12	2455390.031700	12 45 38.9	5 22 ( 63)	12 56 (67)	20 17 (293)
2010-07-13	2455391.071191	13 42 30.9	6 41 ( 70)	13 53 (62)	20 51 (286)
2010-07-14	2455392.108619	14 36 24.7	7 59 ( 78)	14 47 (56)	21 21 (278)
2010-07-15	2455393.144438	15 27 59.5	9 16 ( 86)	15 38 (49)	21 49 (269)
2010-07-16	2455394.179362	16 18 16.9	10 30 ( 95)	16 29 (43)	22 16 (261)
2010-07-17	2455395.214143	17 08 21.9	11 43 (103)	17 19 (37)	22 44 (253)
2010-07-18	2455396.249417	17 59 09.6	12 56 (111)	18 09 (32)	23 15 (247)
2010-07-19	2455397.285569	18 51 13.2	14 06 (117)	19 01 (28)	23 50 (241)
2010-07-20	2455398.322622	19 44 34.5	15 14 (121)	19 55 (25)	f 0 31 (237)
2010-07-21	2455399.360180	20 38 39.6	16 17 (124)	20 49 (23)	f 1 19 (235)
2010-07-22	2455400.397525	21 32 26.1	17 13 (125)	21 43 (23)	f 2 13 (235)
2010-07-23	2455401.433843	22 24 44.0	18 01 (123)	22 35 (24)	f 3 12 (238)
2010-07-24	2455402.468505	23 14 38.8	18 41 (120)	23 25 (27)	f 4 14 (241)
2010-07-26	2455403.501225	0 01 45.8	p19 15 (116)	0 12 (30)	5 16 (246)
2010-07-27	2455404.532071	0 46 10.9	p19 43 (110)	0 57 (34)	6 18 (252)
2010-07-28	2455405.561377	1 28 23.0	p20 08 (104)	1 39 (39)	7 18 (259)
2010-07-29	2455406.589644	2 09 05.2	p20 31 ( 98)	2 20 (44)	8 18 (266)
2010-07-30	2455407.617464	2 49 08.9	p20 52 ( 91)	3 00 (49)	9 17 (273)
2010-07-31	2455408.645485	3 29 29.9	p21 14 ( 84)	3 40 (54)	10 17 (280)
2010-08- 1	2455409.674388	4 11 07.1	p21 36 ( 77)	4 22 (59)	11 18 (286)
2010-08- 2	2455410.704861	4 55 00.0	p22 01 ( 71)	5 06 (63)	12 21 (293)
2010-08- 3	2455411.737551	5 42 04.4	p22 30 ( 65)	5 53 (67)	13 25 (298)
2010-08- 4	2455412.772935	6 33 01.6	p23 04 ( 60)	6 43 (70)	14 30 (302)
2010-08- 5	2455413.811135	7 28 02.0	p23 47 ( 57)	7 38 (72)	15 34 (304)
2010-08- 6	2455414.851704	8 26 27.3	0 39 ( 56)	8 37 (73)	16 33 (304)
2010-08- 7	2455415.893604	9 26 47.4	1 43 ( 57)	9 37 (72)	17 25 (302)
2010-08- 8	2455416.935498	10 27 07.0	2 55 ( 60)	10 37 (69)	18 09 (297)
2010-08- 9	2455417.976273	11 25 50.0	4 12 ( 66)	11 36 (64)	18 46 (290)
2010-08-10	2455419.015407	12 22 11.1	5 32 ( 73)	12 32 (59)	19 19 (282)
2010-08-11	2455420.052982	13 16 17.7	6 51 ( 82)	13 26 (52)	19 49 (273)
2010-08-12	2455421.089490	14 08 51.9	8 09 ( 91)	14 19 (46)	20 17 (265)
2010-08-13	2455422.125574	15 00 49.6	9 26 (100)	15 11 (39)	20 46 (257)
2010-08-14	2455423.161839	15 53 02.9	10 41 (108)	16 03 (34)	21 17 (249)
2010-08-15	2455424.198680	16 46 06.0	11 54 (115)	16 56 (29)	21 51 (243)
2010-08-16	2455425.236172	17 40 05.2	13 05 (120)	17 50 (26)	22 31 (239)
2010-08-17	2455426.274007	18 34 34.2	14 10 (123)	18 45 (24)	23 17 (236)
2010-08-18	2455427.311571	19 28 39.7	15 09 (125)	19 39 (23)	f 0 09 (235)
2010-08-19	2455428.348139	20 21 19.2	15 59 (124)	20 32 (24)	f 1 06 (237)
2010-08-20	2455429.383125	21 11 42.0	16 42 (121)	21 22 (26)	f 2 07 (240)
2010-08-21	2455430.416235	21 59 22.7	17 17 (117)	22 10 (29)	f 3 09 (245)
2010-08-22	2455431.447497	22 44 23.7	17 47 (112)	22 55 (33)	f 4 10 (250)
2010-08-23	2455432.477191	23 27 09.3	18 13 (106)	23 38 (37)	f 5 11 (257)
2010-08-25	2455433.505757	0 08 17.4	p18 36 (100)	0 19 (42)	6 11 (263)
2010-08-26	2455434.533728	0 48 34.1	p18 58 ( 93)	0 59 (47)	7 10 (270)
2010-08-27	2455435.561682	1 28 49.3	p19 19 ( 86)	1 39 (52)	8 09 (277)
2010-08-28	2455436.590220	2 09 55.0	p19 42 ( 80)	2 21 (57)	9 10 (284)
2010-08-29	2455437.619949	2 52 43.6	p20 06 ( 73)	3 03 (62)	10 11 (290)
2010-08-30	2455438.651439	3 38 04.3	p20 33 ( 67)	3 49 (66)	11 14 (296)
2010-08-31	2455439.685145	4 26 36.5	p21 05 ( 62)	4 37 (69)	12 18 (300)
2010-09- 1	2455440.721283	5 18 38.9	p21 43 ( 58)	5 29 (72)	13 21 (303)
2010-09- 2	2455441.759677	6 13 56.1	p22 30 ( 56)	6 24 (73)	14 20 (304)
2010-09- 3	2455442.799686	7 11 32.9	p23 26 ( 56)	7 22 (72)	15 13 (303)

Date	TDT JD	TDT Time	Rise (Azm)	Trans (Alt)	Set (Azm)
		h m s	h m °	h m °	h m °
2010-09- 4	2455443.840332	8 10 04.7	0 32 ( 58)	8 20 (70)	16 00 (299)
2010-09- 5	2455444.880635	9 08 06.8	1 45 ( 63)	9 18 (67)	16 39 (293)
2010-09- 6	2455445.919956	10 04 44.2	3 03 ( 69)	10 15 (62)	17 14 (286)
2010-09- 7	2455446.958154	10 59 44.5	4 22 ( 77)	11 10 (56)	17 45 (278)
2010-09- 8	2455447.995512	11 53 32.2	5 40 ( 86)	12 04 (49)	18 15 (269)
2010-09- 9	2455449.032547	12 46 52.1	6 59 ( 95)	12 57 (43)	18 44 (261)
2010-09-10	2455450.069810	13 40 31.6	8 17 (104)	13 51 (37)	19 15 (253)
2010-09-11	2455451.107692	14 35 04.6	9 34 (112)	14 45 (31)	19 49 (246)
2010-09-12	2455452.146269	15 30 37.6	10 48 (118)	15 41 (27)	20 28 (240)
2010-09-13	2455453.185215	16 26 42.6	11 58 (122)	16 37 (25)	21 13 (237)
2010-09-14	2455454.223865	17 22 22.0	13 00 (124)	17 33 (23)	22 04 (236)
2010-09-15	2455455.261430	18 16 27.5	13 55 (124)	18 27 (24)	23 00 (236)
2010-09-16	2455456.297270	19 08 04.1	14 40 (122)	19 18 (25)	f 0 00 (239)
2010-09-17	2455457.331072	19 56 44.6	15 18 (118)	20 07 (28)	f 1 02 (243)
2010-09-18	2455458.362872	20 42 32.2	15 50 (114)	20 53 (31)	f 2 03 (249)
2010-09-19	2455459.392970	21 25 52.6	16 17 (108)	21 36 (36)	f 3 04 (255)
2010-09-20	2455460.421826	22 07 25.8	16 41 (102)	22 18 (40)	f 4 04 (261)
2010-09-21	2455461.449980	22 47 58.3	17 03 ( 95)	22 59 (45)	f 5 03 (268)
2010-09-22	2455462.478007	23 28 19.8	17 25 ( 89)	23 39 (50)	f 6 03 (275)
2010-09-24	2455463.506488	0 09 20.6	p17 47 ( 82)	0 20 (55)	7 03 (282)
2010-09-25	2455464.535992	0 51 49.7	p18 11 ( 75)	1 02 (60)	8 04 (288)
2010-09-26	2455465.567035	1 36 31.8	p18 37 ( 69)	1 47 (65)	9 07 (294)
2010-09-27	2455466.600021	2 24 01.8	p19 08 ( 64)	2 34 (68)	10 10 (299)
2010-09-28	2455467.635132	3 14 35.4	p19 44 ( 60)	3 25 (71)	11 12 (302)
2010-09-29	2455468.672221	4 07 59.9	p20 27 ( 57)	4 18 (72)	12 12 (304)
2010-09-30	2455469.710760	5 03 29.7	p21 20 ( 56)	5 14 (72)	13 06 (303)
2010-10- 1	2455470.749946	5 59 55.3	p22 20 ( 58)	6 10 (71)	13 53 (301)
2010-10- 2	2455471.788954	6 56 05.6	p23 28 ( 61)	7 06 (68)	14 34 (296)
2010-10- 3	2455472.827224	7 51 12.1	0 41 ( 67)	8 01 (64)	15 10 (290)
2010-10- 4	2455473.864608	8 45 02.1	1 56 ( 74)	8 55 (59)	15 42 (282)
2010-10- 5	2455474.901349	9 37 56.6	3 13 ( 82)	9 48 (53)	16 11 (274)
2010-10- 6	2455475.937947	10 30 38.6	4 30 ( 91)	10 41 (46)	16 40 (265)
2010-10- 7	2455476.974986	11 23 58.8	5 47 ( 99)	11 34 (40)	17 10 (257)
2010-10- 8	2455478.012954	12 18 39.2	7 05 (108)	12 29 (34)	17 43 (249)
2010-10- 9	2455479.052045	13 14 56.7	8 22 (115)	13 25 (29)	18 21 (243)
2010-10-10	2455480.092002	14 12 29.0	9 36 (120)	14 23 (26)	19 04 (239)
2010-10-11	2455481.132094	15 10 13.0	10 44 (123)	15 20 (24)	19 54 (236)
2010-10-12	2455482.171328	16 06 42.7	11 44 (124)	16 17 (24)	20 50 (236)
2010-10-13	2455483.208802	17 00 40.5	12 34 (123)	17 11 (25)	21 50 (238)
2010-10-14	2455484.244002	17 51 21.8	13 16 (120)	18 02 (27)	22 53 (242)
2010-10-15	2455485.276866	18 38 41.2	13 50 (115)	18 49 (30)	23 55 (247)
2010-10-16	2455486.307688	19 23 04.2	14 19 (110)	19 34 (34)	f 0 56 (253)
2010-10-17	2455487.336973	20 05 14.4	14 44 (104)	20 16 (39)	f 1 56 (259)
2010-10-18	2455488.365321	20 46 03.7	15 07 ( 97)	20 57 (44)	f 2 55 (266)
2010-10-19	2455489.393365	21 26 26.8	15 29 ( 91)	21 37 (49)	f 3 54 (273)
2010-10-20	2455490.421740	22 07 18.3	15 52 ( 84)	22 18 (54)	f 4 54 (279)
2010-10-21	2455491.451055	22 49 31.1	16 15 ( 77)	23 00 (59)	f 5 56 (286)
2010-10-22	2455492.481866	23 33 53.2	16 41 ( 71)	23 44 (63)	f 6 58 (292)
2010-10-24	2455493.514603	0 21 01.7	p17 10 ( 66)	0 31 (67)	8 02 (297)
2010-10-25	2455494.549467	1 11 14.0	p17 45 ( 61)	1 22 (70)	9 05 (301)
2010-10-26	2455495.586308	2 04 17.0	p18 27 ( 58)	2 15 (72)	10 06 (303)
2010-10-27	2455496.624566	2 59 22.5	p19 17 ( 56)	3 10 (72)	11 02 (303)
2010-10-28	2455497.663378	3 55 15.9	p20 15 ( 57)	4 05 (71)	11 51 (301)
2010-10-29	2455498.701859	4 50 40.6	p21 20 ( 60)	5 01 (69)	12 33 (297)
2010-10-30	2455499.739398	5 44 44.0	p22 30 ( 65)	5 55 (65)	13 09 (292)
2010-10-31	2455500.775829	6 37 11.6	p23 42 ( 71)	6 47 (60)	13 41 (285)
2010-11- 1	2455501.811397	7 28 24.7	0 55 ( 79)	7 39 (55)	14 10 (277)
2010-11- 2	2455502.846641	8 19 09.7	2 09 ( 87)	8 29 (49)	14 38 (269)
2010-11- 3	2455503.882234	9 10 25.0	3 24 ( 95)	9 21 (43)	15 07 (261)
2010-11- 4	2455504.918831	10 03 07.0	4 39 (104)	10 13 (37)	15 38 (253)
2010-11- 5	2455505.956884	10 57 54.8	5 55 (111)	11 08 (32)	16 13 (246)
2010-11- 6	2455506.996439	11 54 52.4	7 11 (117)	12 05 (27)	16 53 (241)
2010-11- 7	2455508.036980	12 53 15.1	8 22 (122)	13 03 (25)	17 41 (237)
2010-11- 8	2455509.077481	13 51 34.3	9 27 (124)	14 02 (24)	18 35 (236)
2010-11- 9	2455510.116744	14 48 06.7	10 23 (123)	14 58 (24)	19 35 (237)
2010-11-10	2455511.153847	15 41 32.4	11 09 (121)	15 52 (26)	20 38 (241)
2010-11-11	2455512.188395	16 31 17.3	11 47 (117)	16 42 (29)	21 42 (245)
2010-11-12	2455513.220504	17 17 31.5	12 19 (112)	17 28 (33)	22 44 (251)
2010-11-13	2455514.250627	18 00 54.2	12 46 (106)	18 11 (37)	23 45 (257)
2010-11-14	2455515.279390	18 42 19.3	13 10 (100)	18 53 (42)	f 0 45 (263)
2010-11-15	2455516.307482	19 22 46.4	13 32 ( 93)	19 33 (47)	f 1 44 (270)
2010-11-16	2455517.335606	20 03 16.3	13 54 ( 86)	20 14 (52)	f 2 43 (277)
2010-11-17	2455518.364455	20 44 48.9	14 17 ( 80)	20 55 (57)	f 3 44 (284)
2010-11-18	2455519.394684	21 28 20.7	14 42 ( 74)	21 39 (61)	f 4 46 (290)
2010-11-19	2455520.426855	22 14 40.3	15 10 ( 68)	22 25 (66)	f 5 50 (295)
2010-11-20	2455521.461328	23 04 18.8	15 43 ( 63)	23 15 (69)	f 6 54 (300)
2010-11-21	2455522.498105	23 57 16.3	16 23 ( 59)	f 0 08 (71)	f 7 57 (303)
2010-11-23	2455523.536705	0 52 51.3	p17 11 ( 57)	1 03 (72)	8 56 (303)
2010-11-24	2455524.576193	1 49 43.1	p18 08 ( 57)	2 00 (72)	9 48 (302)
2010-11-25	2455525.615467	2 46 16.4	p19 12 ( 59)	2 56 (70)	10 33 (298)
2010-11-26	2455526.653648	3 41 15.2	p20 22 ( 63)	3 51 (66)	11 11 (293)
2010-11-27	2455527.690350	4 34 06.3	p21 33 ( 69)	4 44 (62)	11 44 (287)
2010-11-28	2455528.725702	5 25 00.6	p22 46 ( 77)	5 35 (56)	12 13 (279)

Date	TDT JD	TDT Time	Rise (Azm)	Trans (Alt)	Set (Azm)
		h m s	h m °	h m °	h m °
2010-11-29	2455529.760203	6 14 41.5	p23 58 ( 84)	6 25 (51)	12 41 (271)
2010-11-30	2455530.794556	7 04 09.6	1 10 ( 93)	7 15 (45)	13 08 (263)
2010-12- 1	2455531.829512	7 54 29.8	2 23 (101)	8 05 (39)	13 37 (256)
2010-12- 2	2455532.865723	8 46 38.5	3 36 (108)	8 57 (33)	14 09 (249)
2010-12- 3	2455533.903565	9 41 08.0	4 50 (115)	9 51 (29)	14 46 (243)
2010-12- 4	2455534.942940	10 37 50.0	6 02 (120)	10 48 (26)	15 30 (239)
2010-12- 5	2455535.983169	11 35 45.8	7 09 (123)	11 46 (24)	16 21 (237)
2010-12- 6	2455537.023118	12 33 17.4	8 09 (124)	12 43 (24)	17 18 (237)
2010-12- 7	2455538.061605	13 28 42.6	9 00 (122)	13 39 (25)	18 21 (239)
2010-12- 8	2455539.097816	14 20 51.3	9 42 (119)	14 31 (28)	19 25 (243)
2010-12- 9	2455540.131494	15 09 21.1	10 17 (114)	15 20 (31)	20 29 (248)
2010-12-10	2455541.162858	15 54 31.0	10 46 (108)	16 05 (35)	21 32 (254)
2010-12-11	2455542.192424	16 37 05.4	11 11 (102)	16 48 (40)	22 32 (261)
2010-12-12	2455543.220848	17 18 01.3	11 35 ( 96)	17 29 (45)	23 32 (268)
2010-12-13	2455544.248844	17 58 20.1	11 57 ( 89)	18 09 (50)	f 0 31 (274)
2010-12-14	2455545.277135	18 39 04.5	12 19 ( 83)	18 50 (55)	f 1 30 (281)
2010-12-15	2455546.306443	19 21 16.7	12 43 ( 76)	19 32 (60)	f 2 31 (287)
2010-12-16	2455547.337444	20 05 55.2	13 09 ( 70)	20 16 (64)	f 3 34 (293)
2010-12-17	2455548.370698	20 53 48.3	13 40 ( 65)	21 04 (68)	f 4 38 (298)
2010-12-18	2455549.406505	21 45 22.1	14 16 ( 60)	21 56 (70)	f 5 42 (302)
2010-12-19	2455550.444717	22 40 23.5	15 01 ( 58)	22 51 (72)	f 6 43 (303)
2010-12-20	2455551.484620	23 37 51.2	15 55 ( 57)	23 48 (72)	f 7 39 (303)
2010-12-22	2455552.525065	0 36 05.6	p16 58 ( 58)	0 46 (71)	8 28 (300)
2010-12-23	2455553.564856	1 33 23.6	p18 07 ( 62)	1 43 (68)	9 10 (295)
2010-12-24	2455554.603194	2 28 36.0	p19 21 ( 67)	2 39 (63)	9 45 (289)
2010-12-25	2455555.639866	3 21 24.5	p20 35 ( 74)	3 32 (58)	10 16 (282)
2010-12-26	2455556.675169	4 12 14.6	p21 48 ( 82)	4 23 (52)	10 45 (274)
2010-12-27	2455557.709713	5 01 59.2	p23 01 ( 90)	5 12 (46)	11 12 (266)
2010-12-28	2455558.744235	5 51 41.9	0 14 ( 98)	6 02 (40)	11 40 (258)
2010-12-29	2455559.779443	6 42 23.9	1 26 (106)	6 53 (35)	12 11 (251)
2010-12-30	2455560.815870	7 34 51.1	2 38 (113)	7 45 (30)	12 45 (245)
2010-12-31	2455561.853708	8 29 20.4	3 49 (118)	8 40 (27)	13 25 (240)

for Greenwich Meridian = per il meridiano di Greenwich

for Rome : per Roma

Longitude = longitudine

Latitude = latitudine

Time Zone = fuso orario

UT = tempo universale

Ephemeris Transit = transito

Date = data nel formato anno/mese/giorno

Time = ora

Rise, trans, set = orari di levata, altezza in gradi durante il transito a sud e tramonto.

p = l'evento accade il giorno precedente

F = l'evento accade il giorno seguente

Per località differenti da quella calcolata (42°N, 12°E) fare riferimento alla tabella correttiva posta in fondo all'almanacco.

Tempi in T.U.+1, aggiungere un'ora quando si adotta l'ora legale

Legenda:

Rise, transits, set = times of rising, transit and setting, altitude in ° during the south transit.

P = the event happens in the past day

F = the event happens in the forward day

For different places (42°N, 12°E) to refer to the corrective table in the last pages of the almanac.

Times in local time, to add an hour when it is in use daylight saving time

# VISIBILITA' DELLA LUNA - VISIBILITY OF THE MOON

First and last visibility of the Moon in 2010

prima ed ultima visibilità della Luna nel 2010

location : Rome (Italy)  
latitude : 41° 52' 12'' N  
longitude: 12° 37' 12'' E  
visibility arc: 8°  
factor : 0.33

posizione : Roma  
latitudine : 41° 52' 12'' N  
longitudine : 12° 37' 12'' E

	date	sun r/s	moon r/s	d r/s	moon phs	moon age	period
last visibility	2010-01-13	07:35	06:21	-1:13h	3.7%	-48:36h	
first visibility	2010-01-16	17:04	18:22	1:18h	1.7%	32:51h	30
last visibility	2010-02-12	07:09	06:11	-0:58h	3.1%	-44:42h	
first visibility	2010-02-15	17:42	19:16	1:34h	2.4%	37:49h	30
last visibility	2010-03-14	06:23	05:27	-0:55h	2.6%	-39:38h	
first visibility	2010-03-16	18:16	19:10	0:53h	0.9%	20:14h	29
last visibility	2010-04-13	05:32	04:37	-0:55h	2.0%	-31:57h	
first visibility	2010-04-15	18:50	20:15	1:25h	1.7%	29:20h	30
last visibility	2010-05-13	04:51	04:01	-0:49h	1.0%	-21:13h	
first visibility	2010-05-14	19:21	20:15	0:53h	0.7%	17:16h	29
last visibility	2010-06-11	04:34	03:17	-1:16h	2.3%	-31:41h	
first visibility	2010-06-13	19:45	20:57	1:12h	2.3%	31:29h	30
last visibility	2010-07-10	04:43	02:54	-1:48h	3.8%	-39:57h	
first visibility	2010-07-12	19:44	20:14	0:29h	1.4%	23:03h	29
last visibility	2010-08-09	05:11	04:10	-1:00h	1.4%	-22:58h	
first visibility	2010-08-11	19:15	19:46	0:30h	4.2%	39:06h	30
last visibility	2010-09-07	05:41	04:19	-1:22h	2.5%	-29:49h	
first visibility	2010-09-10	18:28	19:12	0:44h	7.9%	54:57h	30
last visibility	2010-10-06	06:11	04:27	-1:44h	3.8%	-37:34h	
first visibility	2010-10-09	17:38	18:18	0:40h	5.3%	45:52h	29
last visibility	2010-11-05	06:46	05:52	-0:54h	1.4%	-23:06h	
first visibility	2010-11-07	16:56	17:38	0:41h	2.8%	35:04h	29
last visibility	2010-12-04	07:20	05:58	-1:21h	2.7%	-35:16h	
first visibility	2010-12-06	16:38	17:16	0:37h	1.0%	22:01h	29

Date = data nel formato anno/mese/giorno

Sun r/s = ora della levata o del tramonto del Sole

Moon r/s = ora della levata o del tramonto della Luna

D r/s = differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due corpi

Moon phs = fase delle Luna

Moon age = età della Luna

Last visibilità = ultimo giorno di visibilità mattutina prima della congiunzione con il Sole

First visibility = primo giorno di visibilità serale dopo la congiunzione con il Sole

Sun r/s = sunrise and sunset

Moon r/s = rise and set of the Moon

D r/s = difference in hours and minutes between the instants of the rising or the setting of the two objects

Moon phs = phase of the Moon

Moon age : age of the Moon

Period = days between two events

	date	sun r/s	moon r/s	sun lon	moon lon	moon lat	moon alt	moon phs	d az	d lon
L vis	2010-01-13	07:35	06:21	292° 58'	270° 51'	-1° 50'	9° 21'	3.7%	19° 22'	-22° 06'
F vis	2010-01-16	17:04	18:22	296° 25'	311° 13'	1° 49'	11° 37'	1.7%	-6° 54'	14° 48'
L vis	2010-02-12	07:09	06:11	323° 25'	303° 19'	1° 07'	8° 37'	3.1%	17° 24'	-20° 06'
F vis	2010-02-15	17:42	19:16	326° 53'	344° 03'	4° 10'	15° 46'	2.4%	-2° 52'	17° 10'
L vis	2010-03-14	06:23	05:27	353° 31'	335° 17'	3° 39'	9° 18'	2.6%	15° 06'	-18° 14'
F vis	2010-03-16	18:16	19:10	356° 01'	5° 29'	4° 54'	8° 56'	0.9%	1° 42'	9° 29'
L vis	2010-04-13	05:32	04:37	23° 09'	7° 44'	4° 57'	9° 28'	2.0%	11° 49'	-15° 25'
F vis	2010-04-15	18:50	20:15	25° 39'	40° 10'	4° 33'	13° 29'	1.7%	-1° 03'	14° 31'
L vis	2010-05-13	04:51	04:01	52° 18'	41° 26'	4° 30'	7° 41'	1.0%	7° 10'	-10° 52'
F vis	2010-05-14	19:21	20:15	53° 51'	62° 51'	3° 18'	7° 43'	0.7%	-1° 47'	9° 00'
L vis	2010-06-11	04:34	03:17	80° 08'	63° 04'	3° 18'	11° 31'	2.3%	11° 22'	-17° 04'
F vis	2010-06-13	19:45	20:57	82° 39'	100° 04'	0° 10'	10° 52'	2.3%	-12° 07'	17° 25'
L vis	2010-07-10	04:43	02:54	107° 49'	85° 18'	1° 31'	16° 35'	3.8%	13° 23'	-22° 31'
F vis	2010-07-12	19:44	20:14	110° 19'	123° 38'	-1° 57'	4° 19'	1.4%	-12° 03'	13° 19'
L vis	2010-08-09	05:11	04:10	136° 30'	122° 59'	-1° 54'	9° 25'	1.4%	7° 52'	-13° 30'
F vis	2010-08-11	19:15	19:46	138° 58'	162° 11'	-4° 31'	4° 55'	4.2%	-22° 43'	23° 13'
L vis	2010-09-07	05:41	04:19	164° 28'	146° 43'	-3° 42'	13° 38'	2.5%	9° 41'	-17° 46'
F vis	2010-09-10	18:28	19:12	167° 54'	200° 18'	-4° 57'	6° 50'	7.9%	-31° 42'	32° 24'
L vis	2010-10-06	06:11	04:27	192° 51'	170° 45'	-4° 49'	17° 21'	3.8%	12° 16'	-22° 06'
F vis	2010-10-09	17:38	18:18	196° 17'	222° 38'	-4° 03'	5° 38'	5.3%	-25° 40'	26° 21'
L vis	2010-11-05	06:46	05:52	222° 42'	209° 42'	-4° 36'	7° 54'	1.4%	9° 54'	-13° 00'
F vis	2010-11-07	16:56	17:38	225° 08'	244° 21'	-2° 31'	5° 26'	2.8%	-18° 04'	19° 13'
L vis	2010-12-04	07:20	05:58	251° 59'	233° 16'	-3° 21'	10° 50'	2.7%	14° 23'	-18° 43'
F vis	2010-12-06	16:38	17:16	254° 24'	265° 48'	-0° 38'	4° 49'	1.0%	-9° 27'	11° 24'

Sun lon = longitudine celeste del Sole

Moon lon = longitudine celeste della Luna

Moon lat = latitudine celeste della Luna

Luna alt = altezza della Luna sull'orizzonte quando il Sole è sull'orizzonte

D az = differenza in azimut tra i centri del Sole e della Luna nell'istante della sua visibilità

D lon = differenza in longitudine tra i centri del Sole e della Luna nell'istante della sua visibilità

Sun lon = celestial longitude of the Sun

Moon lon = celestial longitude of the Moon

Moon lat = celestial latitude of the Moon

Moon alt = altitude of the Moon above the horizon when the Sun is above the horizon

D az : difference in azimuth between the center of the Sun and of the Moon

D lon : difference in longitude between the center of the Sun and the Moon

# First and last visibility of the Moon in 2010

# prima ed ultima visibilit  della Luna nel 2010

location : Rome (Italy)  
 latitude : 41° 52' 12'' N  
 longitude: 12° 37' 12'' E  
 visibility arc: 4°  
 factor : 0.33

posizione : Roma  
 latitudine : 41° 52' 12'' N  
 longitudine : 12° 37' 12'' E

	date	sun r/s	moon r/s	d r/s	moon phs	moon age	period
last visibility	2010-01-14	07:35	07:03	-0:32h	0.9%	-24:37h	
first visibility	2010-01-16	17:04	18:22	1:18h	1.7%	32:51h	30
last visibility	2010-02-13	07:08	06:37	-0:31h	0.7%	-20:44h	
first visibility	2010-02-14	17:41	18:15	0:34h	0.4%	13:48h	29
last visibility	2010-03-15	06:21	05:49	-0:32h	0.5%	-15:40h	
first visibility	2010-03-16	18:16	19:10	0:53h	0.9%	20:14h	30
last visibility	2010-04-14	05:31	05:01	-0:29h	0.3%	-7:58h	
first visibility	2010-04-14	18:49	19:08	0:18h	0.2%	5:19h	29
last visibility	2010-05-13	04:51	04:01	-0:49h	1.0%	-21:13h	
first visibility	2010-05-14	19:21	20:15	0:53h	0.7%	17:16h	30
last visibility	2010-06-11	04:34	03:17	-1:16h	2.3%	-31:41h	
first visibility	2010-06-13	19:45	20:57	1:12h	2.3%	31:29h	30
last visibility	2010-07-11	04:44	04:03	-0:40h	0.6%	-15:57h	
first visibility	2010-07-12	19:44	20:14	0:29h	1.4%	23:03h	29
last visibility	2010-08-09	05:11	04:10	-1:00h	1.4%	-22:58h	
first visibility	2010-08-11	19:15	19:46	0:30h	4.2%	39:06h	30
last visibility	2010-09-07	05:41	04:19	-1:22h	2.5%	-29:49h	
first visibility	2010-09-09	18:29	18:41	0:11h	2.7%	30:59h	29
last visibility	2010-10-07	06:12	05:44	-0:28h	0.7%	-13:32h	
first visibility	2010-10-09	17:38	18:18	0:40h	5.3%	45:52h	30
last visibility	2010-11-05	06:46	05:52	-0:54h	1.4%	-23:06h	
first visibility	2010-11-07	16:56	17:38	0:41h	2.8%	35:04h	29
last visibility	2010-12-04	07:20	05:58	-1:21h	2.7%	-35:16h	
first visibility	2010-12-06	16:38	17:16	0:37h	1.0%	22:01h	29

Date = data nel formato anno/mese/giorno

Sun r/s = ora della levata o del tramonto del Sole

Moon r/s = ora della levata o del tramonto della Luna

D r/s : differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due corpi

Moon phs = fase delle Luna

Moon age = et  della Luna

Period = giorni tra due eventi

last visibilit  = ultimo giorno di visibilit  mattutina prima della congiunzione con il Sole

first visibilit  = primo giorno di visibilit  serale dopo la congiunzione con il Sole

Sun r/s = sunrise and sunset

Moon r/s = rise and set of the Moon

D r/s = difference in hours and minutes between the instants of the rising or the setting of the two objects

Moon phs = phase of the Moon

Moon age = age of the Moon

Period = days between two events

	date	sun r/s	moon r/s	sun lon	moon lon	moon lat	moon alt	moon phs	d az	d lon
L vis	2010-01-14	07:35	07:03	293° 59'	282° 50'	-0° 46'	4° 09'	0.9%	9° 37'	-11° 09'
F vis	2010-01-16	17:04	18:22	296° 25'	311° 13'	1° 49'	11° 37'	1.7%	-6° 54'	14° 48'
L vis	2010-02-13	07:08	06:37	324° 25'	315° 06'	2° 08'	4° 39'	0.7%	7° 17'	-9° 20'
F vis	2010-02-14	17:41	18:15	325° 53'	332° 08'	3° 26'	5° 29'	0.4%	0° 42'	6° 15'
L vis	2010-03-15	06:21	05:49	354° 31'	347° 16'	4° 18'	5° 22'	0.5%	4° 46'	-7° 15'
F vis	2010-03-16	18:16	19:10	356° 01'	5° 29'	4° 54'	8° 56'	0.9%	1° 42'	9° 29'
L vis	2010-04-14	05:31	05:01	24° 08'	20° 15'	4° 59'	4° 36'	0.3%	1° 20'	-3° 53'
F vis	2010-04-14	18:49	19:08	24° 40'	27° 17'	4° 54'	2° 40'	0.2%	3° 38'	2° 37'
L vis	2010-05-13	04:51	04:01	52° 18'	41° 26'	4° 30'	7° 41'	1.0%	7° 10'	-10° 52'
F vis	2010-05-14	19:21	20:15	53° 51'	62° 51'	3° 18'	7° 43'	0.7%	-1° 47'	9° 00'
L vis	2010-06-11	04:34	03:17	80° 08'	63° 04'	3° 18'	11° 31'	2.3%	11° 22'	-17° 04'
F vis	2010-06-13	19:45	20:57	82° 39'	100° 04'	0° 10'	10° 52'	2.3%	-12° 07'	17° 25'
L vis	2010-07-11	04:44	04:03	108° 46'	99° 41'	0° 13'	5° 32'	0.6%	5° 31'	-9° 05'
F vis	2010-07-12	19:44	20:14	110° 19'	123° 38'	-1° 57'	4° 19'	1.4%	-12° 03'	13° 19'
L vis	2010-08-09	05:11	04:10	136° 30'	122° 59'	-1° 54'	9° 25'	1.4%	7° 52'	-13° 30'
F vis	2010-08-11	19:15	19:46	138° 58'	162° 11'	-4° 31'	4° 55'	4.2%	-22° 43'	23° 13'
L vis	2010-09-07	05:41	04:19	164° 28'	146° 43'	-3° 42'	13° 38'	2.5%	9° 41'	-17° 46'
F vis	2010-09-09	18:29	18:41	166° 56'	185° 22'	-5° 02'	1° 35'	2.7%	-18° 50'	18° 26'
L vis	2010-10-07	06:12	05:44	193° 50'	185° 54'	-5° 00'	4° 10'	0.7%	7° 22'	-7° 57'
F vis	2010-10-09	17:38	18:18	196° 17'	222° 38'	-4° 03'	5° 38'	5.3%	-25° 40'	26° 21'
L vis	2010-11-05	06:46	05:52	222° 42'	209° 42'	-4° 36'	7° 54'	1.4%	9° 54'	-13° 00'
F vis	2010-11-07	16:56	17:38	225° 08'	244° 21'	-2° 31'	5° 26'	2.8%	-18° 04'	19° 13'
L vis	2010-12-04	07:20	05:58	251° 59'	233° 16'	-3° 21'	10° 50'	2.7%	14° 23'	-18° 43'
F vis	2010-12-06	16:38	17:16	254° 24'	265° 48'	-0° 38'	4° 49'	1.0%	-9° 27'	11° 24'

Sun lon = longitudine celeste del Sole

Moon lon = longitudine celeste della Luna

Moon lat = latitudine celeste della Luna

Luna alt = altezza della Luna sull'orizzonte quando il Sole   sull'orizzonte

D az = differenza in azimut tra i centri del Sole e della Luna nell'istante della sua visibilit 

D lon = differenza in longitudine tra i centri del Sole e della Luna nell'istante della sua visibilit 

Sun lon = celestial longitude of the Sun

Moon lon = celestial longitude of the Moon

Moon lat = celestial latitude of the Moon

Moon alt = altitude of the Moon above the horizon when the Sun is above the horizon

D az = difference in azimuth between the center of the Sun and of the Moon

D lon = difference in longitude between the center of the Sun and the Moon

# First and last visibility of the Moon in 2010

# prima ed ultima visibilità della Luna nel 2010

location : Rome (Italy)  
 latitude : 41° 52' 12'' N  
 longitude: 12° 37' 12'' E  
 visibility arc: 0°  
 factor : 0.33

posizione : Roma  
 latitudine : 41° 52' 12'' N  
 longitudine : 12° 37' 12'' E

	date	sun r/s	moon r/s	d r/s	moon phs	moon age	period
last visibility	2010-01-14	07:35	07:03	-0:32h	0.9%	-24:37h	
first visibility	2010-01-15	17:03	17:20	0:17h	0.1%	8:50h	29
last visibility	2010-02-14	07:07	07:00	-0:06h	0.1%	3:14h	
first visibility	2010-02-14	17:41	18:15	0:34h	0.4%	13:48h	30
last visibility	2010-03-16	06:19	06:10	-0:09h	0.3%	8:17h	
first visibility	2010-03-16	18:16	19:10	0:53h	0.9%	20:14h	30
last visibility	2010-04-14	05:31	05:01	-0:29h	0.3%	-7:58h	
first visibility	2010-04-14	18:49	19:08	0:18h	0.2%	5:19h	29
last visibility	2010-05-14	04:50	04:40	-0:10h	0.1%	2:45h	
first visibility	2010-05-14	19:21	20:15	0:53h	0.7%	17:16h	30
last visibility	2010-06-12	04:33	04:11	-0:22h	0.2%	-7:41h	
first visibility	2010-06-12	19:45	20:04	0:19h	0.1%	7:29h	29
last visibility	2010-07-11	04:44	04:03	-0:40h	0.6%	-15:57h	
first visibility	2010-07-12	19:44	20:14	0:29h	1.4%	23:03h	30
last visibility	2010-08-09	05:11	04:10	-1:00h	1.4%	-22:58h	
first visibility	2010-08-11	19:15	19:46	0:30h	4.2%	39:06h	30
last visibility	2010-09-08	05:42	05:37	-0:04h	0.2%	-5:48h	
first visibility	2010-09-09	18:29	18:41	0:11h	2.7%	30:59h	29
last visibility	2010-10-07	06:12	05:44	-0:28h	0.7%	-13:32h	
first visibility	2010-10-09	17:38	18:18	0:40h	5.3%	45:52h	30
last visibility	2010-11-05	06:46	05:52	-0:54h	1.4%	-23:06h	
first visibility	2010-11-07	16:56	17:38	0:41h	2.8%	35:04h	29
last visibility	2010-12-05	07:21	07:05	-0:15h	0.3%	-11:15h	
first visibility	2010-12-06	16:38	17:16	0:37h	1.0%	22:01h	29

Sun r/s = ora della levata o del tramonto del Sole

Moon r/s = ora della levata o del tramonto della Luna

D r/s : differenza in ore e minuti tra gli istanti del sorgere o del tramonto dei due corpi

Moon phs = fase delle Luna

Moon age = età della Luna

Period = giorni tra due eventi

Last visibilità = ultimo giorno di visibilità mattutina prima della congiunzione con il Sole

First visibility = primo giorno di visibilità serale dopo la congiunzione con il Sole

Sun r/s = sunrise and sunset

Moon r/s = rise and set of the Moon

D r/s = difference in hours and minutes between the instants of the rising or the setting of the two objects

Moon phs = phase of the Moon

Moon age = age of the Moon

Period = days between two events

	date	sun r/s	moon r/s	sun lon	moon lon	moon lat	moon alt	moon phs	d az	d lon
L vis	2010-01-14	07:35	07:03	293° 59'	282° 50'	-0° 46'	4° 09'	0.9%	9° 37'	-11° 09'
F vis	2010-01-15	17:03	17:20	295° 24'	299° 24'	0° 46'	2° 17'	0.1%	-1° 39'	4° 00'
L vis	2010-02-14	07:07	07:00	325° 26'	326° 54'	3° 04'	0° 47'	0.1%	-2° 43'	1° 28'
F vis	2010-02-14	17:41	18:15	325° 53'	332° 08'	3° 26'	5° 29'	0.4%	0° 42'	6° 15'
L vis	2010-03-16	06:19	06:10	355° 31'	359° 23'	4° 45'	1° 17'	0.3%	-5° 31'	3° 53'
F vis	2010-03-16	18:16	19:10	356° 01'	5° 29'	4° 54'	8° 56'	0.9%	1° 42'	9° 29'
L vis	2010-04-14	05:31	05:01	24° 08'	20° 15'	4° 59'	4° 36'	0.3%	1° 20'	-3° 53'
F vis	2010-04-14	18:49	19:08	24° 40'	27° 17'	4° 54'	2° 40'	0.2%	3° 38'	2° 37'
L vis	2010-05-14	04:50	04:40	53° 16'	54° 42'	3° 49'	1° 09'	0.1%	-3° 10'	1° 26'
F vis	2010-05-14	19:21	20:15	53° 51'	62° 51'	3° 18'	7° 43'	0.7%	-1° 47'	9° 00'
L vis	2010-06-12	04:33	04:11	81° 05'	76° 54'	2° 14'	2° 48'	0.2%	1° 50'	-4° 11'
F vis	2010-06-12	19:45	20:04	81° 42'	85° 49'	1° 28'	2° 25'	0.1%	-1° 46'	4° 07'
L vis	2010-07-11	04:44	04:03	108° 46'	99° 41'	0° 13'	5° 32'	0.6%	5° 31'	-9° 05'
F vis	2010-07-12	19:44	20:14	110° 19'	123° 38'	-1° 57'	4° 19'	1.4%	-12° 03'	13° 19'
L vis	2010-08-09	05:11	04:10	136° 30'	122° 59'	-1° 54'	9° 25'	1.4%	7° 52'	-13° 30'
F vis	2010-08-11	19:15	19:46	138° 58'	162° 11'	-4° 31'	4° 55'	4.2%	-22° 43'	23° 13'
L vis	2010-09-08	05:42	05:37	165° 27'	161° 59'	-4° 28'	0° 23'	0.2%	5° 22'	-3° 28'
F vis	2010-09-09	18:29	18:41	166° 56'	185° 22'	-5° 02'	1° 35'	2.7%	-18° 50'	18° 26'
L vis	2010-10-07	06:12	05:44	193° 50'	185° 54'	-5° 00'	4° 10'	0.7%	7° 22'	-7° 57'
F vis	2010-10-09	17:38	18:18	196° 17'	222° 38'	-4° 03'	5° 38'	5.3%	-25° 40'	26° 21'
L vis	2010-11-05	06:46	05:52	222° 42'	209° 42'	-4° 36'	7° 54'	1.4%	9° 54'	-13° 00'
F vis	2010-11-07	16:56	17:38	225° 08'	244° 21'	-2° 31'	5° 26'	2.8%	-18° 04'	19° 13'
L vis	2010-12-05	07:21	07:05	253° 00'	247° 06'	-2° 17'	1° 44'	0.3%	5° 28'	-5° 54'
F vis	2010-12-06	16:38	17:16	254° 24'	265° 48'	-0° 38'	4° 49'	1.0%	-9° 27'	11° 24'

Sun lon = longitudine celeste del Sole

Moon lon = longitudine celeste della Luna

Moon lat = latitudine celeste della Luna

Luna alt = altezza della Luna sull'orizzonte quando il Sole è sull'orizzonte

D az = differenza in azimut tra i centri del Sole e della Luna nell'istante della sua visibilità

D lon = differenza in longitudine tra i centri del Sole e della Luna nell'istante della sua visibilità

Sun lon = celestial longitude of the Sun

Moon lon = celestial longitude of the Moon

Moon lat = celestial latitude of the Moon

Moon alt = altitude of the Moon above the horizon when the Sun is above the horizon

D az = difference in azimuth between the center of the Sun and of the Moon

D lon = difference in longitude between the center of the Sun and the Moon

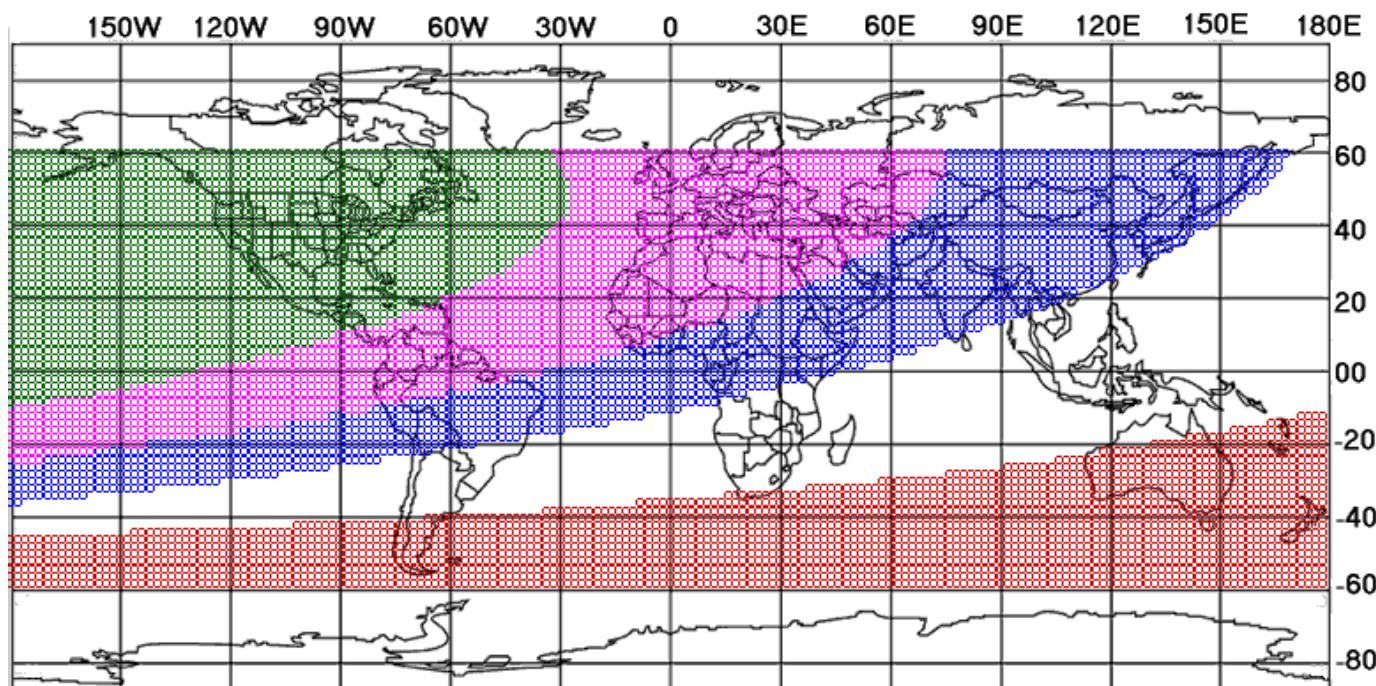
- Crescent Visibility on: Tuesday 16/03/2010 CE  
 - Calculations are Done at Sunset Time at: 18.20 LT  
 - Calculations are Topocentric.  
 - ITALY Rome, Long: 12:14:00.0, Lat: 41:48:00.0, Ele:100.0, Zone:1.00  
 - Summer time is: Off  
 - Height above mean sea-level affects rise and set events.  
 - Refraction Settings: Temperature: 10 °C Pressure: 1010 mb  
 - Delta T: 65.20 Second(s)

- T. Conjunction Time: 15/03/2010 CE, 22.59 LT  
 - Julian Date at Time of Calculations: 2455272.22248

- Sunset: 18.20 LT	T. Moon Age: +19H 22M
- Moonset: 19.14 LT	Moon Lag Time: +00H 54M
- T. Moon Right Ascension: +00H 09M 43S	T. Moon Declination: +06°:05':52"
- T. Sun Right Ascension: +23H 45M 21S	T. Sun Declination: -01°:35':12"
- T. Moon Longitude: +04°:39':21"	T. Moon Latitude: +04°:37':44"
- T. Sun Longitude: +356°:00':35"	T. Sun Latitude: -00°:00':02"
- T. Moon Altitude: +08°:27':42"	T. Moon Azimuth: +270°:37':59"
- T. Sun Altitude: -01°:11':26"	T. Sun Azimuth: +268°:56':09"
- T. Relative Altitude: +09°:39':08"	T. Elongation: +09°:47':58"
- T. Relative Azimuth: +01°:41':50"	T. Phase Angle: +170°:10':27"
- T. Crescent Width: +00°:00':13"	T. Moon Semi-Diameter: +00°:15':00"
- T. Illumination: 00.73 %	G. Horizontal Parallax: +00°:54':54"
- T. Magnitude: -04.95	G. Distance: 399439.52 Km

#### Note

- formato data : gg/mm/aaaa
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- LT = local time, ora locale
- Date format: dd/mm/yyyy
- The Prefix 'G.' means Geocentric, and 'T.' means Topocentric
- For New Crescent: Moon Lag Time = Moonset - Sunset
- For Old Crescent: Moon Lag Time = Sunrise - Moonrise
- For New Crescent: Best Time = Sunset + 4/9 (Moon Lag Time)
- For Old Crescent: Best Time = Sunrise - 4/9 (Moon Lag Time)



Rosso : non visibile  
 Bianco : impossibile da vedere  
 Blu : visibile con strumenti  
 Rosa : potrebbe essere vista ad occhio nudo  
 Verde : facilmente visibile ad occhio nudo



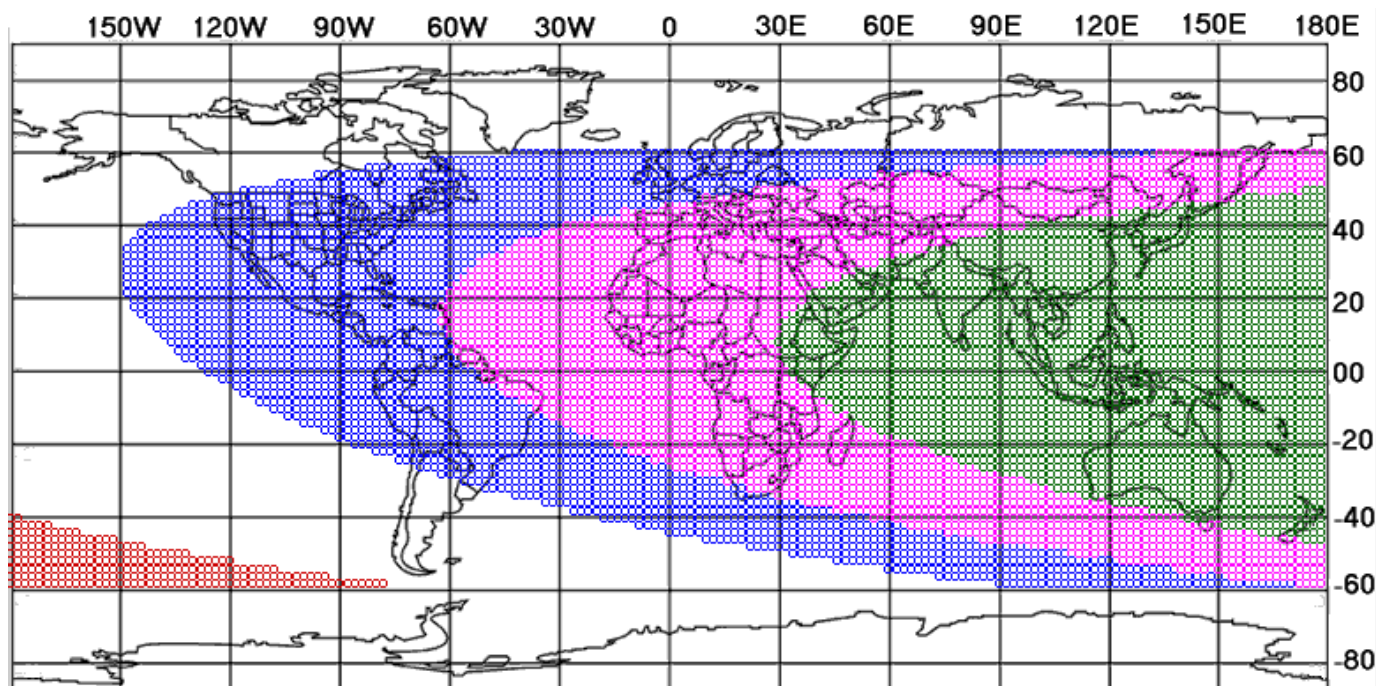
- Crescent Visibility on: Thursday 13/05/2010 CE  
 - Calculations are Done at Sunrise Time at: 04.51 LT  
 - Calculations are Topocentric.  
 - ITALY Rome, Long: 12:14:00.0, Lat: 41:48:00.0, Ele:100.0, Zone:1.00  
 - Summer time is: Off  
 - Height above mean sea-level affects rise and set events.  
 - Refraction Settings: Temperature: 10 °C Pressure: 1010 mb  
 - Delta T: 65.20 Second(s)

- T. Conjunction Time: 14/05/2010 CE, 01.52 LT  
 - Julian Date at Time of Calculations: 2455329.66068

- Moonrise: 04.01 LT	T. Moon Age: -21H 01M
- Sunrise: 04.51 LT	Moon Lag Time: +00H 50M
- T. Moon Right Ascension: +02H 33M 03S	T. Moon Declination: +18°:54':28"
- T. Sun Right Ascension: +03H 19M 34S	T. Sun Declination: +18°:20':32"
- T. Moon Longitude: +41°:53':52"	T. Moon Latitude: +03°:41':06"
- T. Sun Longitude: +52°:18':02"	T. Sun Latitude: -00°:00':07"
- T. Moon Altitude: +07°:12':11"	T. Moon Azimuth: +71°:01':33"
- T. Sun Altitude: -01°:11':11"	T. Sun Azimuth: +63°:50':55"
- T. Relative Altitude: +08°:23':22"	T. Elongation: +11°:01':48"
- T. Relative Azimuth: +07°:10':38"	T. Phase Angle: +168°:56':31"
- T. Crescent Width: +00°:00':17"	T. Moon Semi-Diameter: +00°:15':31"
- T. Illumination: 00.93 %	G. Horizontal Parallax: +00°:56':50"
- T. Magnitude: -05.08	G. Distance: 385848.01 Km

#### Note

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- LT = local time, ora locale
- Date format: dd/mm/yyyy
- The Prefix 'G.' means Geocentric, and 'T.' means Topocentric
- For New Crescent: Moon Lag Time = Moonset - Sunset
- For Old Crescent: Moon Lag Time = Sunrise - Moonrise
- For New Crescent: Best Time = Sunset + 4/9 (Moon Lag Time)
- For Old Crescent: Best Time = Sunrise - 4/9 (Moon Lag Time)



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 Verde : facilmente visibile ad occhio nudo

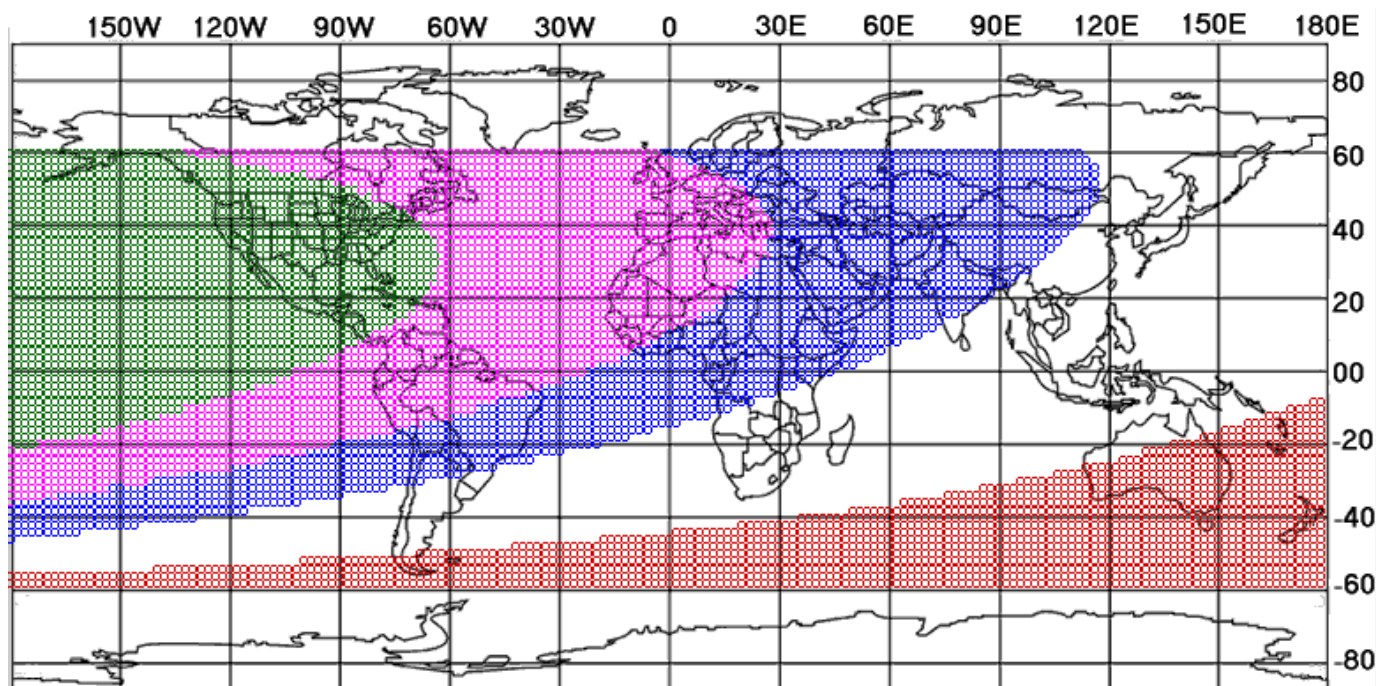
- Crescent Visibility on: Friday 14/05/2010 CE  
 - Calculations are Done at Sunset Time at: 19.25 LT  
 - Calculations are Topocentric.  
 - ITALY Rome, Long: 12:14:00.0, Lat: 41:48:00.0, Ele:100.0, Zone:1.00  
 - Summer time is: Off  
 - Height above mean sea-level affects rise and set events.  
 - Refraction Settings: Temperature: 10 °C Pressure: 1010 mb  
 - Delta T: 65.20 Second(s)

- T. Conjunction Time: 14/05/2010 CE, 01.52 LT  
 - Julian Date at Time of Calculations: 2455331.26742

- Sunset: 19.25 LT	T. Moon Age: +17H 33M
- Moonset: 20.20 LT	Moon Lag Time: +00H 54M
- T. Moon Right Ascension: +03H 57M 28S	T. Moon Declination: +23°:19':33"
- T. Sun Right Ascension: +03H 25M 53S	T. Sun Declination: +18°:43':59"
- T. Moon Longitude: +62°:03':56"	T. Moon Latitude: +02°:48':32"
- T. Sun Longitude: +53°:50':55"	T. Sun Latitude: -00°:00':04"
- T. Moon Altitude: +07°:18':13"	T. Moon Azimuth: +294°:53':29"
- T. Sun Altitude: -01°:11':11"	T. Sun Azimuth: +296°:42':24"
- T. Relative Altitude: +08°:29':24"	T. Elongation: +08°:40':52"
- T. Relative Azimuth: -01°:48':55"	T. Phase Angle: +171°:17':50"
- T. Crescent Width: +00°:00':11"	T. Moon Semi-Diameter: +00°:15':47"
- T. Illumination: 00.58 %	G. Horizontal Parallax: +00°:57':47"
- T. Magnitude: -04.83	G. Distance: 379490.71 Km

#### Note

- formato data : gg/mm/yyyy
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- LT = local time, ora locale
- Date format: dd/mm/yyyy
- The Prefix 'G.' means Geocentric, and 'T.' means Topocentric
- For New Crescent: Moon Lag Time = Moonset - Sunset
- For Old Crescent: Moon Lag Time = Sunrise - Moonrise
- For New Crescent: Best Time = Sunset + 4/9 (Moon Lag Time)
- For Old Crescent: Best Time = Sunrise - 4/9 (Moon Lag Time)



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 Blu : visibile con strumenti  
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 Verde : facilmente visibile ad occhio nudo

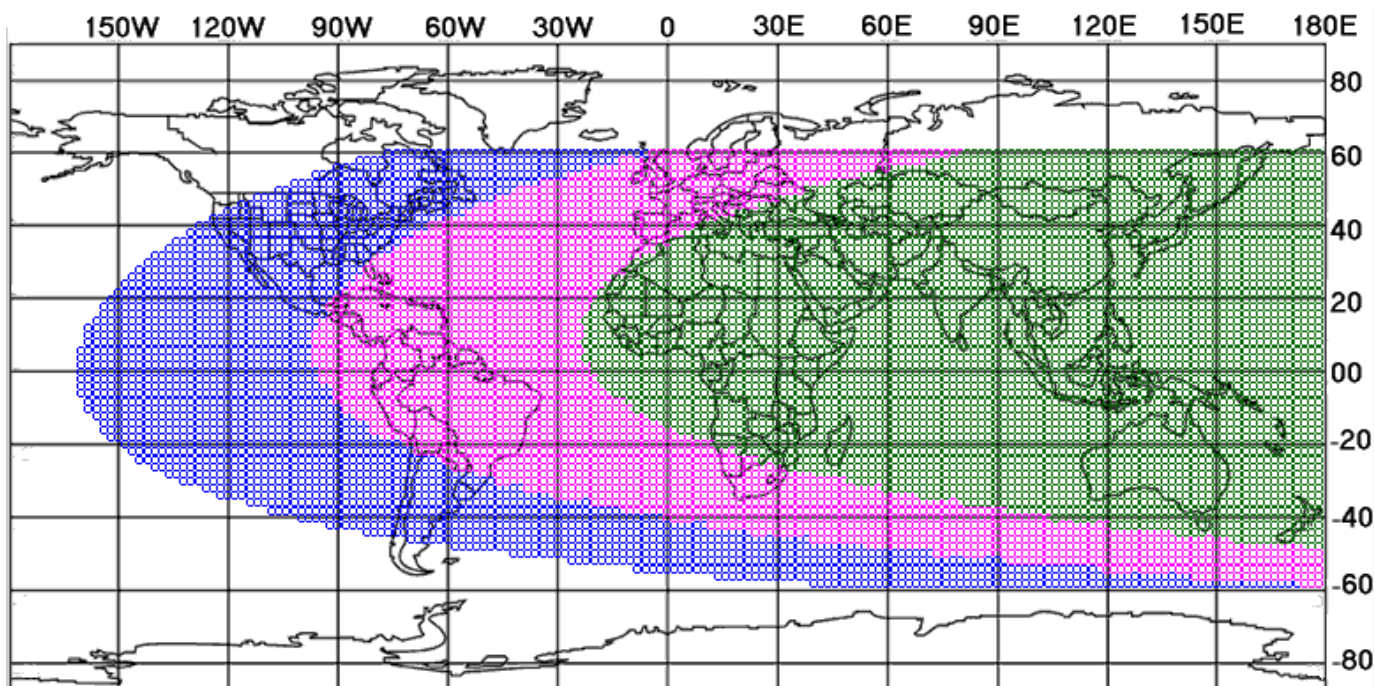
- Crescent Visibility on: Monday 09/08/2010 CE  
 - Calculations are Done at Sunrise Time at: 05.11 LT  
 - Calculations are Topocentric.  
 - ITALY Rome, Long: 12:14:00.0, Lat: 41:48:00.0, Ele:100.0, Zone:1.00  
 - Summer time is: Off  
 - Height above mean sea-level affects rise and set events.  
 - Refraction Settings: Temperature: 10 °C Pressure: 1010 mb  
 - Delta T: 65.20 Second(s)

- T. Conjunction Time: 10/08/2010 CE, 02.56 LT  
 - Julian Date at Time of Calculations: 2455417.67416

- Moonrise: 04.10 LT	T. Moon Age: -21H 45M
- Sunrise: 05.11 LT	Moon Lag Time: +01H 01M
- T. Moon Right Ascension: +08H 22M 27S	T. Moon Declination: +16°:59':20"
- T. Sun Right Ascension: +09H 15M 48S	T. Sun Declination: +15°:53':28"
- T. Moon Longitude: +123°:52':29"	T. Moon Latitude: -02°:21':36"
- T. Sun Longitude: +136°:29':42"	T. Sun Latitude: -00°:00':04"
- T. Moon Altitude: +08°:57':59"	T. Moon Azimuth: +75°:11':02"
- T. Sun Altitude: -01°:11':08"	T. Sun Azimuth: +67°:18':06"
- T. Relative Altitude: +10°:09':07"	T. Elongation: +12°:50':07"
- T. Relative Azimuth: +07°:52':56"	T. Phase Angle: +167°:08':04"
- T. Crescent Width: +00°:00':25"	T. Moon Semi-Diameter: +00°:16':38"
- T. Illumination: 01.26 %	G. Horizontal Parallax: +01°:00':53"
- T. Magnitude: -05.26	G. Distance: 360195.47 Km

#### Note

- formato data : gg/mm/aaaa
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- LT = local time, ora locale
- Date format: dd/mm/yyyy
- The Prefix 'G.' means Geocentric, and 'T.' means Topocentric
- For New Crescent: Moon Lag Time = Moonset - Sunset
- For Old Crescent: Moon Lag Time = Sunrise - Moonrise
- For New Crescent: Best Time = Sunset + 4/9 (Moon Lag Time)
- For Old Crescent: Best Time = Sunrise - 4/9 (Moon Lag Time)



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 Verde : facilmente visibile ad occhio nudo

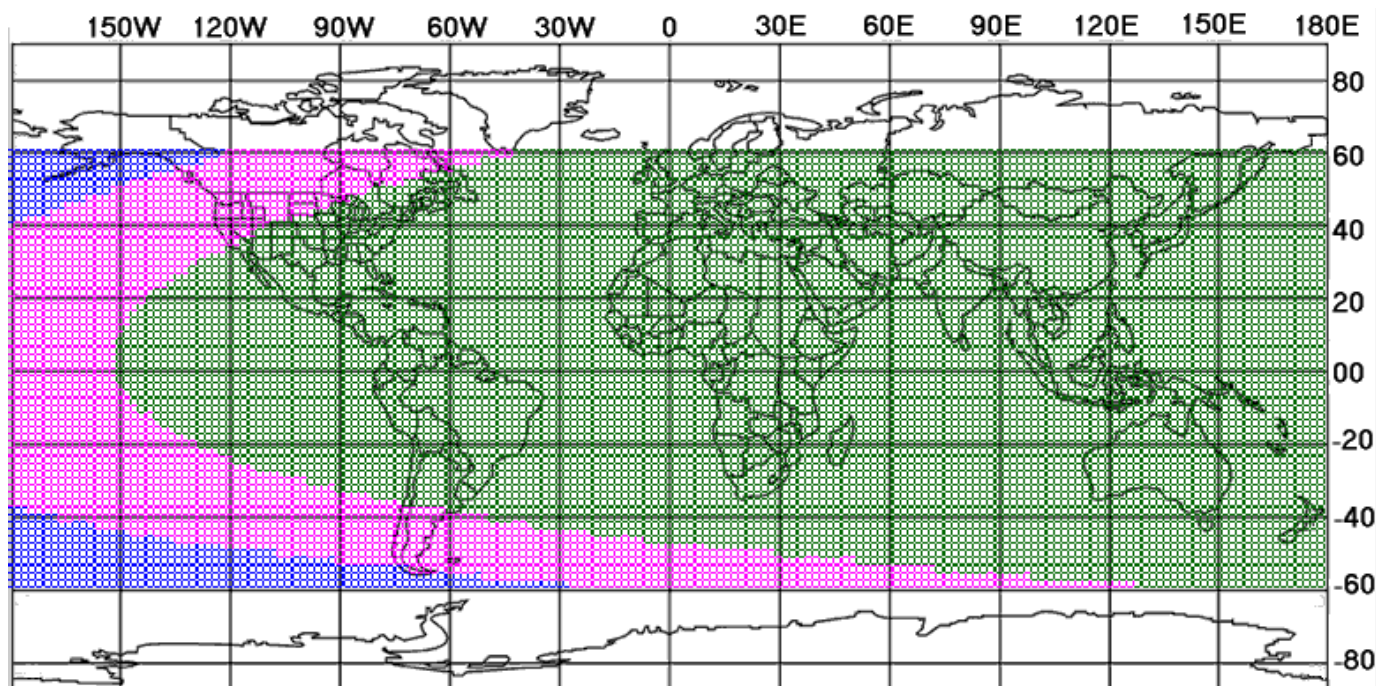
- Crescent Visibility on: Tuesday 07/09/2010 CE  
 - Calculations are Done at Sunrise Time at: 05.41 LT  
 - Calculations are Topocentric.  
 - ITALY Rome, Long: 12:14:00.0, Lat: 41:48:00.0, Ele:100.0, Zone:1.00  
 - Summer time is: Off  
 - Height above mean sea-level affects rise and set events.  
 - Refraction Settings: Temperature: 10 °C Pressure: 1010 mb  
 - Delta T: 65.20 Second(s)

- T. Conjunction Time: 08/09/2010 CE, 10.39 LT  
 - Julian Date at Time of Calculations: 2455446.69500

- Moonrise: 04.19 LT	T. Moon Age: -28H 59M
- Sunrise: 05.41 LT	Moon Lag Time: +01H 22M
- T. Moon Right Ascension: +09H 53M 39S	T. Moon Declination: +08°:29':13"
- T. Sun Right Ascension: +11H 02M 48S	T. Sun Declination: +06°:06':41"
- T. Moon Longitude: +147°:38':00"	T. Moon Latitude: -04°:03':05"
- T. Sun Longitude: +164°:28':26"	T. Sun Latitude: -00°:00':03"
- T. Moon Altitude: +13°:13':13"	T. Moon Azimuth: +90°:22':58"
- T. Sun Altitude: -01°:11':14"	T. Sun Azimuth: +80°:42':49"
- T. Relative Altitude: +14°:24':27"	T. Elongation: +17°:18':25"
- T. Relative Azimuth: +09°:40':09"	T. Phase Angle: +162°:39':09"
- T. Crescent Width: +00°:00':46"	T. Moon Semi-Diameter: +00°:16':45"
- T. Illumination: 02.27 %	G. Horizontal Parallax: +01°:01':14"
- T. Magnitude: -05.70	G. Distance: 358106.85 Km

#### Note

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- Date format: dd/mm/yyyy
- The Prefix 'G.' means Geocentric, and 'T.' means Topocentric
- For New Crescent: Moon Lag Time = Moonset - Sunset
- For Old Crescent: Moon Lag Time = Sunrise - Moonrise
- For New Crescent: Best Time = Sunset + 4/9 (Moon Lag Time)
- For Old Crescent: Best Time = Sunrise - 4/9 (Moon Lag Time)



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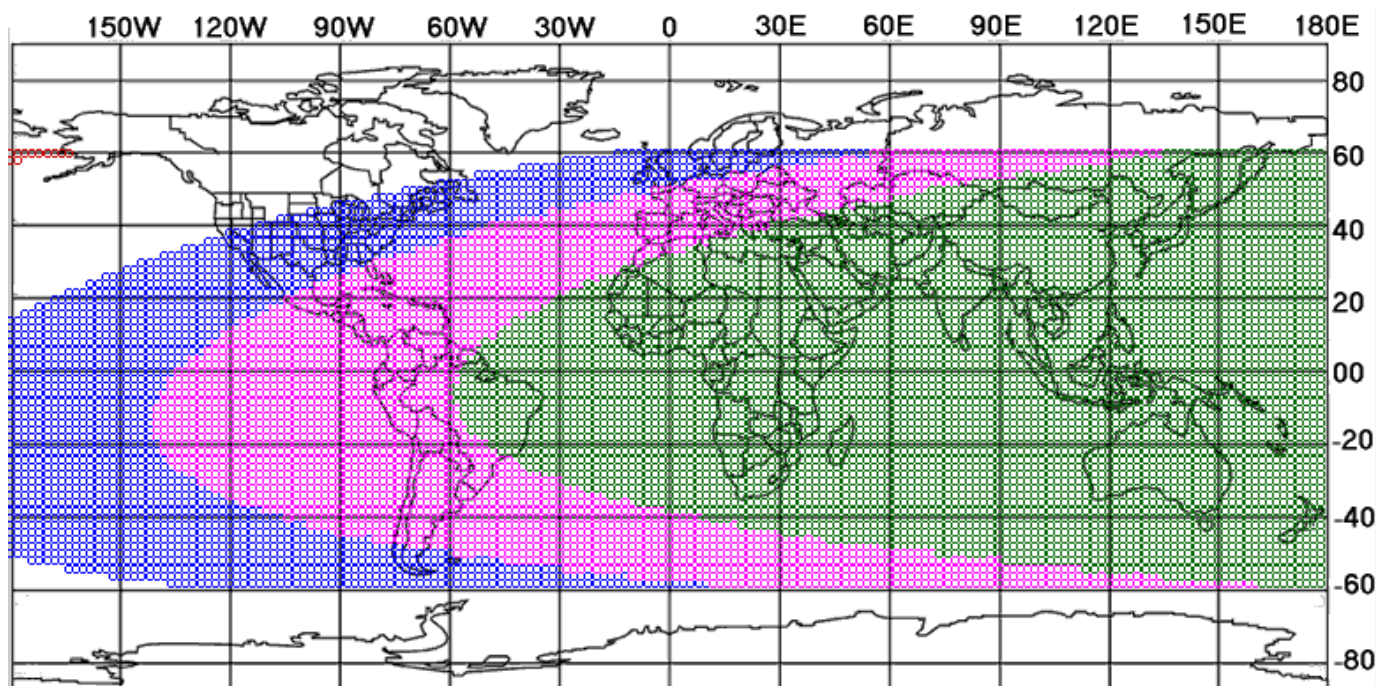
- Crescent Visibility on: Friday 05/11/2010 CE  
 - Calculations are Done at Sunrise Time at: 06.46 LT  
 - Calculations are Topocentric.  
 - ITALY Rome, Long: 12:14:00.0, Lat: 41:48:00.0, Ele:100.0, Zone:1.00  
 - Summer time is: Off  
 - Height above mean sea-level affects rise and set events.  
 - Refraction Settings: Temperature: 10 °C Pressure: 1010 mb  
 - Delta T: 65.20 Second(s)

- T. Conjunction Time: 06/11/2010 CE, 04.24 LT  
 - Julian Date at Time of Calculations: 2455505.74018

- Moonrise: 05.52 LT	T. Moon Age: -21H 38M
- Sunrise: 06.46 LT	Moon Lag Time: +00H 54M
- T. Moon Right Ascension: +13H 46M 33S	T. Moon Declination: -16°:23':36"
- T. Sun Right Ascension: +14H 41M 02S	T. Sun Declination: -15°:39':06"
- T. Moon Longitude: +210°:35':09"	T. Moon Latitude: -05°:02':28"
- T. Sun Longitude: +222°:42':19"	T. Sun Latitude: -00°:00':04"
- T. Moon Altitude: +07°:28':34"	T. Moon Azimuth: +119°:56':41"
- T. Sun Altitude: -01°:11':30"	T. Sun Azimuth: +110°:04':59"
- T. Relative Altitude: +08°:40':03"	T. Elongation: +13°:06':40"
- T. Relative Azimuth: +09°:51':42"	T. Phase Angle: +166°:51':25"
- T. Crescent Width: +00°:00':26"	T. Moon Semi-Diameter: +00°:16':23"
- T. Illumination: 01.31 %	G. Horizontal Parallax: +00°:59':57"
- T. Magnitude: -05.29	G. Distance: 365759.83 Km

#### Note

- formato data : gg/mm/aaaa
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- LT = local time, ora locale
- 
- Date format: dd/mm/yyyy
- The Prefix 'G.' means Geocentric, and 'T.' means Topocentric
- For New Crescent: Moon Lag Time = Moonset - Sunset
- For Old Crescent: Moon Lag Time = Sunrise - Moonrise
- For New Crescent: Best Time = Sunset + 4/9 (Moon Lag Time)
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Altezza ai crepuscoli. Il Sole è 12° sotto l'orizzonte

Altitude in the twilights. The Sun is 12° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:01:01	06:31	15.5	286.1	174.0	17:56	0.5	62.6	167.3
2010:01:02	06:31	23.8	273.7	159.9	17:57	-11.9	55.9	153.2
2010:01:03	06:31	30.7	259.7	145.9	17:57	-24.0	48.9	139.3
2010:01:04	06:32	35.7	243.9	132.1	17:58	-35.6	40.7	125.6
2010:01:05	06:32	38.3	226.9	118.5	17:59	-46.2	30.4	112.2
2010:01:06	06:32	38.3	209.8	105.4	18:00	-55.2	16.1	99.3
2010:01:07	06:32	35.9	193.7	92.7	18:01	-61.5	355.8	86.7
2010:01:08	06:32	31.8	179.4	80.3	18:02	-63.5	330.2	74.6
2010:01:09	06:31	26.5	166.7	68.3	18:03	-60.9	305.8	62.7
2010:01:10	06:31	20.3	155.5	56.6	18:04	-54.7	287.7	51.1
2010:01:11	06:31	13.8	145.3	45.1	18:05	-46.6	275.4	39.7
2010:01:12	06:31	7.1	135.8	33.8	18:06	-37.6	266.8	28.4
2010:01:13	06:31	0.5	126.6	22.7	18:07	-28.2	260.4	17.3
2010:01:14	06:30	-6.0	117.5	11.7	18:08	-18.4	255.2	6.4
2010:01:15	06:30	-12.2	108.2	0.8	18:09	-8.6	250.8	4.5
2010:01:16	06:30	-17.9	98.4	10.1	18:10	1.4	246.8	15.4
2010:01:17	06:29	-23.0	88.0	20.9	18:11	11.4	242.8	26.2
2010:01:18	06:29	-27.4	76.9	31.7	18:12	21.4	238.6	37.0
2010:01:19	06:29	-30.8	65.0	42.6	18:13	31.4	233.8	47.9
2010:01:20	06:28	-33.0	52.2	53.5	18:14	41.2	227.8	58.9
2010:01:21	06:28	-34.0	38.8	64.5	18:15	50.8	219.5	70.0
2010:01:22	06:27	-33.6	25.1	75.8	18:16	59.6	206.5	81.4
2010:01:23	06:26	-31.7	11.4	87.3	18:17	66.2	185.0	93.1
2010:01:24	06:26	-28.4	357.9	99.2	18:18	68.2	153.7	105.2
2010:01:25	06:25	-23.9	345.0	111.5	18:20	63.7	124.3	117.8
2010:01:26	06:24	-18.4	332.4	124.3	18:21	54.7	105.5	130.8
2010:01:27	06:24	-12.0	320.1	137.5	18:22	43.3	94.2	144.3
2010:01:28	06:23	-5.0	307.8	151.2	18:23	30.7	86.6	158.2
2010:01:29	06:22	2.2	295.4	165.2	18:24	17.4	81.0	172.3
2010:01:30	06:21	9.3	282.6	178.2	18:25	4.0	76.4	173.0
2010:01:31	06:21	15.8	269.1	166.0	18:26	-9.5	72.2	158.9
2010:02:01	06:20	21.2	254.9	152.0	18:27	-22.6	67.7	144.9
2010:02:02	06:19	25.2	240.0	138.2	18:29	-35.3	62.6	131.3
2010:02:03	06:18	27.6	224.7	124.8	18:30	-47.2	55.9	118.1
2010:02:04	06:17	28.3	209.6	111.8	18:31	-58.0	45.7	105.4
2010:02:05	06:16	27.3	195.0	99.4	18:32	-66.9	28.3	93.2
2010:02:06	06:15	25.1	181.3	87.3	18:33	-71.9	358.2	81.3
2010:02:07	06:14	21.9	168.6	75.7	18:34	-70.6	323.1	69.8
2010:02:08	06:13	17.9	156.7	64.3	18:36	-64.1	299.7	58.5
2010:02:09	06:12	13.4	145.6	53.2	18:37	-55.4	286.8	47.5
2010:02:10	06:11	8.6	135.1	42.2	18:38	-45.9	279.1	36.5
2010:02:11	06:09	3.7	124.9	31.3	18:39	-36.0	273.9	25.7
2010:02:12	06:08	-1.3	114.8	20.6	18:40	-25.9	270.0	15.0
2010:02:13	06:07	-6.2	104.7	10.0	18:41	-15.7	266.9	4.9
2010:02:14	06:06	-10.8	94.4	3.2	18:43	-5.4	264.2	7.5
2010:02:15	06:05	-15.1	83.8	12.4	18:44	5.1	261.6	18.1
2010:02:16	06:03	-18.9	72.7	23.2	18:45	15.7	258.8	29.0
2010:02:17	06:02	-22.1	61.0	34.2	18:46	26.3	255.7	40.0
2010:02:18	06:01	-24.5	48.7	45.3	18:47	37.1	251.8	51.3
2010:02:19	05:59	-26.0	35.9	56.6	18:48	47.8	246.2	62.7
2010:02:20	05:58	-26.5	22.6	68.1	18:50	58.2	237.3	74.5
2010:02:21	05:57	-25.8	9.1	80.0	18:51	67.6	220.3	86.5
2010:02:22	05:55	-24.0	355.4	92.1	18:52	73.2	186.3	98.9
2010:02:23	05:54	-21.1	341.7	104.7	18:53	70.5	144.9	111.7
2010:02:24	05:52	-17.2	328.2	117.7	18:54	61.1	121.2	124.9
2010:02:25	05:51	-12.3	314.8	131.1	18:55	49.1	109.3	138.5
2010:02:26	05:49	-6.9	301.5	144.8	18:56	36.1	102.3	152.4
2010:02:27	05:48	-1.1	288.1	158.7	18:58	22.5	97.5	166.3
2010:02:28	05:46	4.8	274.7	172.2	18:59	8.9	93.7	175.9
2010:03:01	05:45	10.2	261.0	171.7	19:00	-4.7	90.3	164.4
2010:03:02	05:43	15.0	247.0	158.4	19:01	-17.8	86.9	150.9
2010:03:03	05:42	18.8	232.8	144.9	19:02	-30.4	82.9	137.6
2010:03:04	05:40	21.4	218.4	131.9	19:03	-42.4	77.9	124.8
2010:03:05	05:39	22.7	204.2	119.2	19:05	-53.5	70.6	112.4
2010:03:06	05:37	22.9	190.4	107.1	19:06	-63.4	58.6	100.4
2010:03:07	05:35	21.9	177.1	95.3	19:07	-70.9	36.6	88.9
2010:03:08	05:34	20.1	164.4	83.9	19:08	-73.5	1.1	77.6
2010:03:09	05:32	17.5	152.3	72.8	19:09	-69.6	328.9	66.6
2010:03:10	05:30	14.3	140.8	61.9	19:10	-62.0	310.7	55.7
2010:03:11	05:29	10.7	129.8	51.1	19:11	-52.9	300.5	45.0
2010:03:12	05:27	6.8	119.0	40.4	19:13	-43.2	294.1	34.2
2010:03:13	05:25	2.6	108.5	29.7	19:14	-33.2	289.6	23.5
2010:03:14	05:24	-1.6	97.9	19.0	19:15	-23.0	286.1	13.0
2010:03:15	05:22	-5.9	87.3	8.8	19:16	-12.5	283.0	4.7
2010:03:16	05:20	-10.0	76.4	5.8	19:17	-1.9	280.1	11.1
2010:03:17	05:18	-13.8	65.1	15.5	19:18	8.9	277.1	21.9
2010:03:18	05:17	-17.3	53.3	26.6	19:20	19.9	273.8	33.2
2010:03:19	05:15	-20.1	40.9	38.0	19:21	30.9	269.6	44.9
2010:03:20	05:13	-22.3	28.0	49.7	19:22	41.9	264.0	56.7
2010:03:21	05:11	-23.5	14.6	61.6	19:23	52.6	255.5	68.8
2010:03:22	05:10	-23.7	0.8	73.8	19:24	62.4	240.9	81.2
2010:03:23	05:08	-22.7	346.7	86.3	19:26	69.2	214.1	93.9
2010:03:24	05:06	-20.7	332.6	99.1	19:27	69.3	176.5	106.9
2010:03:25	05:04	-17.6	318.5	112.2	19:28	62.1	148.4	120.3
2010:03:26	05:02	-13.6	304.7	125.6	19:29	51.3	132.9	133.8

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:03:27	05:01	-8.9	291.1	139.2	19:30	39.1	123.7	147.5
2010:03:28	04:59	-3.7	277.7	152.9	19:32	26.3	117.3	161.1
2010:03:29	04:57	1.6	264.3	166.2	19:33	13.4	112.3	173.3
2010:03:30	04:55	6.8	251.0	175.0	19:34	0.6	107.9	169.6
2010:03:31	04:53	11.5	237.6	164.8	19:35	-11.8	103.5	157.0
2010:04:01	04:51	15.6	224.1	152.0	19:36	-23.6	98.7	144.3
2010:04:02	04:50	18.7	210.5	139.5	19:38	-34.8	92.9	131.9
2010:04:03	04:48	20.8	197.0	127.2	19:39	-45.1	85.5	119.9
2010:04:04	04:46	21.9	183.6	115.4	19:40	-54.2	75.1	108.2
2010:04:05	04:44	21.9	170.6	103.9	19:41	-61.7	59.6	96.9
2010:04:06	04:42	21.0	157.9	92.7	19:43	-66.1	37.2	85.9
2010:04:07	04:41	19.3	145.7	81.8	19:44	-66.3	10.7	75.0
2010:04:08	04:39	16.9	133.9	70.9	19:45	-62.2	348.1	64.2
2010:04:09	04:37	13.9	122.5	60.2	19:46	-55.5	332.5	53.4
2010:04:10	04:35	10.4	111.5	49.4	19:48	-47.2	321.8	42.5
2010:04:11	04:33	6.4	100.6	38.5	19:49	-38.1	314.0	31.6
2010:04:12	04:31	2.2	89.7	27.6	19:50	-28.4	307.9	20.6
2010:04:13	04:30	-2.2	78.8	16.7	19:52	-18.3	302.7	9.9
2010:04:14	04:28	-6.7	67.7	6.7	19:53	-8.0	297.8	5.8
2010:04:15	04:26	-11.1	56.2	8.7	19:54	2.6	292.9	15.7
2010:04:16	04:24	-15.2	44.2	19.7	19:55	13.3	287.6	27.4
2010:04:17	04:22	-18.9	31.6	31.6	19:57	24.0	281.5	39.5
2010:04:18	04:21	-21.8	18.4	43.8	19:58	34.4	273.8	51.9
2010:04:19	04:19	-23.8	4.5	56.3	19:59	44.2	263.5	64.6
2010:04:20	04:17	-24.7	350.2	69.0	20:01	52.6	248.8	77.4
2010:04:21	04:15	-24.4	335.5	81.8	20:02	58.3	228.0	90.4
2010:04:22	04:14	-22.8	321.0	94.8	20:03	59.5	202.4	103.5
2010:04:23	04:12	-19.9	306.6	108.0	20:05	55.5	178.6	116.8
2010:04:24	04:10	-16.1	292.8	121.3	20:06	47.8	160.8	130.2
2010:04:25	04:09	-11.4	279.3	134.7	20:07	38.1	148.1	143.5
2010:04:26	04:07	-6.2	266.4	148.0	20:09	27.4	138.6	156.8
2010:04:27	04:05	-0.7	253.7	161.0	20:10	16.5	130.8	169.4
2010:04:28	04:04	4.8	241.2	173.0	20:11	5.5	123.9	174.2
2010:04:29	04:02	10.0	228.7	171.0	20:13	-5.1	117.3	163.1
2010:04:30	04:00	14.6	216.1	159.2	20:14	-15.2	110.5	151.0
2010:05:01	03:59	18.5	203.4	147.1	20:16	-24.7	103.1	139.1
2010:05:02	03:57	21.6	190.6	135.3	20:17	-33.3	94.6	127.5
2010:05:03	03:56	23.6	177.7	123.8	20:18	-40.9	84.4	116.1
2010:05:04	03:54	24.7	164.8	112.6	20:20	-47.0	72.0	105.0
2010:05:05	03:52	24.7	152.1	101.5	20:21	-51.4	57.1	94.0
2010:05:06	03:51	23.6	139.6	90.7	20:22	-53.3	40.1	83.2
2010:05:07	03:49	21.7	127.5	79.8	20:24	-52.7	22.6	72.3
2010:05:08	03:48	18.9	115.7	69.0	20:25	-49.5	6.4	61.4
2010:05:09	03:46	15.3	104.3	58.0	20:26	-44.4	352.5	50.3
2010:05:10	03:45	11.1	93.2	46.9	20:28	-37.8	340.8	39.0
2010:05:11	03:44	6.4	82.2	35.6	20:29	-30.1	330.8	27.5
2010:05:12	03:42	1.2	71.3	24.0	20:30	-21.6	322.0	15.8
2010:05:13	03:41	-4.2	60.2	12.3	20:32	-12.6	313.8	5.0
2010:05:14	03:40	-9.8	48.7	3.9	20:33	-3.3	305.8	10.1
2010:05:15	03:38	-15.1	36.7	13.7	20:34	6.1	297.5	22.4
2010:05:16	03:37	-20.1	24.0	26.2	20:36	15.3	288.5	35.2
2010:05:17	03:36	-24.3	10.5	39.0	20:37	24.1	278.4	48.2
2010:05:18	03:35	-27.4	356.1	52.0	20:38	31.9	266.6	61.4
2010:05:19	03:33	-29.1	341.0	65.2	20:40	38.3	252.5	74.6
2010:05:20	03:32	-29.3	325.6	78.3	20:41	42.6	236.1	87.8
2010:05:21	03:31	-27.8	310.4	91.5	20:42	44.1	218.1	101.0
2010:05:22	03:30	-24.9	295.8	104.7	20:43	42.6	200.1	114.1
2010:05:23	03:29	-20.6	282.0	117.8	20:45	38.6	183.7	127.2
2010:05:24	03:28	-15.4	269.2	130.8	20:46	32.7	169.5	140.1
2010:05:25	03:27	-9.6	257.1	143.7	20:47	25.6	157.4	152.9
2010:05:26	03:26	-3.3	245.6	156.4	20:48	17.9	146.8	165.3
2010:05:27	03:25	3.0	234.4	168.7	20:49	10.0	137.2	176.4
2010:05:28	03:24	9.2	223.4	176.7	20:50	2.1	128.1	169.4
2010:05:29	03:23	15.0	212.2	166.2	20:51	-5.5	119.2	157.7
2010:05:30	03:23	20.2	200.8	154.6	20:52	-12.6	110.2	146.2
2010:05:31	03:22	24.7	188.9	143.2	20:54	-19.1	100.8	134.9
2010:06:01	03:21	28.2	176.6	131.9	20:55	-24.8	90.8	123.8
2010:06:02	03:20	30.6	163.8	120.9	20:56	-29.7	79.9	112.8
2010:06:03	03:20	31.8	150.7	109.9	20:56	-33.5	68.2	101.9
2010:06:04	03:19	31.6	137.6	99.0	20:57	-36.1	55.6	91.0
2010:06:05	03:19	30.2	124.6	88.1	20:58	-37.3	42.3	80.1
2010:06:06	03:18	27.4	112.1	77.1	20:59	-37.0	28.5	68.9
2010:06:07	03:18	23.5	100.2	66.0	21:00	-35.2	14.9	57.5
2010:06:08	03:17	18.5	88.8	54.5	21:01	-32.0	1.6	45.8
2010:06:09	03:17	12.7	78.0	42.7	21:01	-27.6	348.9	33.8
2010:06:10	03:17	6.1	67.4	30.6	21:02	-22.1	336.8	21.4
2010:06:11	03:16	-1.1	56.9	18.1	21:03	-15.8	325.2	8.7
2010:06:12	03:16	-8.5	46.2	5.4	21:04	-8.9	313.9	5.0
2010:06:13	03:16	-16.0	35.0	8.3	21:04	-1.8	302.6	18.1
2010:06:14	03:16	-23.2	23.0	21.6	21:05	5.3	291.2	31.6
2010:06:15	03:16	-29.6	9.6	35.1	21:05	12.0	279.2	45.2
2010:06:16	03:16	-34.7	354.8	48.7	21:06	18.0	266.6	58.7
2010:06:17	03:16	-37.9	338.6	62.2	21:06	23.0	253.2	72.1
2010:06:18	03:16	-38.9	321.7	75.6	21:06	26.7	239.1	85.4
2010:06:19	03:16	-37.5	305.0	88.8	21:07	28.8	224.4	98.5
2010:06:20	03:16	-34.1	289.7	101.8	21:07	29.3	209.6	111.3
2010:06:21	03:16	-28.9	276.0	114.6	21:07	28.3	195.1	124.0
2010:06:22	03:17	-22.6	264.0	127.2	21:07	26.0	181.2	136.4
2010:06:23	03:17	-15.5	253.3	139.6	21:08	22.6	168.2	148.6
2010:06:24	03:17	-8.0	243.6	151.7	21:08	18.4	156.0	160.6



Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:06:25	03:17	-0.2	234.6	163.7	21:08	13.7	144.6	172.4
2010:06:26	03:18	7.6	225.7	175.4	21:08	8.7	133.8	175.9
2010:06:27	03:18	15.2	216.9	173.0	21:08	3.7	123.5	164.5
2010:06:28	03:19	22.4	207.6	161.6	21:08	-1.3	113.3	153.3
2010:06:29	03:19	29.1	197.6	150.4	21:08	-6.1	103.3	142.3
2010:06:30	03:20	34.9	186.5	139.4	21:07	-10.7	93.1	131.3
2010:07:01	03:21	39.7	174.1	128.5	21:07	-14.8	82.7	120.4
2010:07:02	03:21	43.0	160.2	117.6	21:07	-18.5	71.9	109.5
2010:07:03	03:22	44.4	145.2	106.7	21:07	-21.6	60.6	98.6
2010:07:04	03:23	43.8	129.8	95.7	21:06	-24.0	48.7	87.4
2010:07:05	03:23	41.1	115.0	84.5	21:06	-25.6	36.2	76.1
2010:07:06	03:24	36.4	101.6	73.0	21:05	-26.3	23.1	64.4
2010:07:07	03:25	30.1	89.7	61.2	21:05	-25.9	9.6	52.3
2010:07:08	03:26	22.4	79.1	49.0	21:04	-24.4	355.8	39.8
2010:07:09	03:27	13.6	69.6	36.4	21:04	-21.8	341.8	26.8
2010:07:10	03:28	4.1	60.7	23.3	21:03	-18.1	328.0	13.4
2010:07:11	03:29	-6.0	52.0	9.8	21:02	-13.6	314.4	0.7
2010:07:12	03:30	-16.4	43.0	4.0	21:02	-8.4	301.1	14.2
2010:07:13	03:31	-26.5	33.1	18.0	21:01	-2.9	288.0	28.1
2010:07:14	03:32	-36.0	21.6	31.9	21:00	2.6	274.9	42.0
2010:07:15	03:33	-44.2	7.4	45.8	20:59	7.9	261.9	55.8
2010:07:16	03:34	-50.1	349.7	59.5	20:58	12.6	248.7	69.2
2010:07:17	03:35	-52.7	329.2	72.9	20:57	16.5	235.4	82.4
2010:07:18	03:36	-51.6	308.5	85.9	20:56	19.6	221.9	95.2
2010:07:19	03:37	-47.3	290.6	98.7	20:55	21.6	208.4	107.6
2010:07:20	03:38	-40.7	276.5	111.1	20:54	22.6	194.9	119.8
2010:07:21	03:40	-32.8	265.5	123.2	20:53	22.5	181.6	131.7
2010:07:22	03:41	-24.2	256.7	135.1	20:52	21.4	168.6	143.4
2010:07:23	03:42	-15.1	249.3	146.7	20:51	19.5	156.0	154.9
2010:07:24	03:43	-5.9	242.8	158.2	20:50	16.9	144.0	166.2
2010:07:25	03:44	3.4	236.8	169.4	20:49	13.8	132.5	176.9
2010:07:26	03:46	12.7	230.8	178.0	20:47	10.1	121.4	171.3
2010:07:27	03:47	21.8	224.6	168.1	20:46	6.2	110.6	160.4
2010:07:28	03:48	30.7	217.7	157.2	20:45	2.2	100.1	149.6
2010:07:29	03:49	39.1	209.5	146.4	20:44	-2.0	89.7	138.7
2010:07:30	03:51	46.9	199.2	135.5	20:42	-6.1	79.2	127.9
2010:07:31	03:52	53.4	185.7	124.6	20:41	-10.1	68.5	116.9
2010:08:01	03:53	57.9	167.9	113.6	20:39	-13.9	57.5	105.8
2010:08:02	03:55	59.2	146.7	102.4	20:38	-17.3	45.9	94.5
2010:08:03	03:56	56.8	125.7	91.0	20:37	-20.2	33.6	82.9
2010:08:04	03:57	51.0	108.3	79.3	20:35	-22.4	20.6	70.9
2010:08:05	03:58	42.9	95.2	67.1	20:34	-23.8	6.8	58.5
2010:08:06	04:00	33.1	85.3	54.5	20:32	-24.0	352.3	45.6
2010:08:07	04:01	22.1	77.5	41.5	20:31	-23.0	337.4	32.3
2010:08:08	04:02	10.3	70.8	28.0	20:29	-20.7	322.5	18.6
2010:08:09	04:04	-2.0	64.7	14.3	20:27	-17.2	307.7	5.3
2010:08:10	04:05	-14.5	58.7	3.0	20:26	-12.8	293.3	10.3
2010:08:11	04:06	-27.0	52.0	14.8	20:24	-7.6	279.4	24.3
2010:08:12	04:08	-39.0	43.9	28.8	20:23	-2.2	266.0	38.2
2010:08:13	04:09	-50.1	32.8	42.7	20:21	3.2	252.9	51.9
2010:08:14	04:10	-59.3	16.2	56.3	20:19	8.3	240.0	65.2
2010:08:15	04:11	-64.9	351.3	69.5	20:18	12.9	227.2	78.1
2010:08:16	04:13	-64.9	321.9	82.2	20:16	16.8	214.3	90.5
2010:08:17	04:14	-59.9	298.2	94.6	20:14	19.8	201.4	102.6
2010:08:18	04:15	-52.0	282.9	106.6	20:12	21.9	188.5	114.3
2010:08:19	04:17	-42.8	272.9	118.2	20:11	22.9	175.5	125.8
2010:08:20	04:18	-33.1	266.0	129.6	20:09	23.0	162.6	137.0
2010:08:21	04:19	-23.2	260.7	140.8	20:07	22.2	150.0	148.1
2010:08:22	04:20	-13.2	256.4	151.8	20:05	20.4	137.8	159.0
2010:08:23	04:22	-3.1	252.6	162.7	20:04	17.8	126.0	169.5
2010:08:24	04:23	7.0	248.9	172.8	20:02	14.6	114.6	175.9
2010:08:25	04:24	17.1	245.2	173.7	20:00	10.9	103.5	167.4
2010:08:26	04:25	27.2	241.1	163.7	19:58	6.7	92.8	156.9
2010:08:27	04:27	37.1	236.2	153.1	19:56	2.2	82.3	146.1
2010:08:28	04:28	46.9	229.6	142.2	19:55	-2.4	71.8	135.1
2010:08:29	04:29	56.1	219.8	131.2	19:53	-7.1	61.1	124.0
2010:08:30	04:30	64.1	204.0	120.0	19:51	-11.6	50.1	112.7
2010:08:31	04:32	69.1	177.9	108.6	19:49	-16.0	38.5	101.2
2010:09:01	04:33	68.4	145.3	96.9	19:47	-19.9	26.2	89.3
2010:09:02	04:34	62.1	120.4	84.9	19:45	-23.1	13.0	77.1
2010:09:03	04:35	52.5	105.5	72.4	19:44	-25.4	358.8	64.4
2010:09:04	04:36	41.3	96.2	59.6	19:42	-26.5	343.7	51.2
2010:09:05	04:38	29.0	89.9	46.2	19:40	-26.0	328.1	37.7
2010:09:06	04:39	16.0	84.9	32.6	19:38	-24.0	312.4	23.9
2010:09:07	04:40	2.7	80.7	18.7	19:36	-20.4	297.1	10.4
2010:09:08	04:41	-10.8	76.6	6.0	19:34	-15.6	282.5	6.8
2010:09:09	04:42	-24.2	72.3	11.3	19:33	-10.0	268.6	19.7
2010:09:10	04:43	-37.2	66.9	24.9	19:31	-4.0	255.5	33.3
2010:09:11	04:45	-49.6	59.5	38.5	19:29	2.2	242.9	46.7
2010:09:12	04:46	-60.7	47.5	51.8	19:27	8.0	230.5	59.7
2010:09:13	04:47	-69.3	25.5	64.7	19:25	13.3	218.3	72.3
2010:09:14	04:48	-72.4	349.3	77.1	19:23	18.0	206.0	84.4
2010:09:15	04:49	-68.4	316.2	89.0	19:21	21.7	193.5	96.1
2010:09:16	04:50	-60.3	297.6	100.6	19:20	24.5	180.8	107.4
2010:09:17	04:51	-50.9	287.4	111.9	19:18	26.2	167.9	118.6
2010:09:18	04:52	-41.0	281.0	123.0	19:16	26.8	155.0	129.5
2010:09:19	04:54	-30.9	276.5	133.9	19:14	26.2	142.2	140.3
2010:09:20	04:55	-20.7	273.0	144.7	19:12	24.6	129.6	151.1
2010:09:21	04:56	-10.4	270.1	155.4	19:10	21.9	117.6	161.6
2010:09:22	04:57	-0.1	267.4	165.8	19:09	18.4	106.0	171.6

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:09:23	04:58	10.3	264.6	174.5	19:07	14.1	94.9	173.6
2010:09:24	04:59	20.8	261.6	170.1	19:05	9.3	84.1	164.1
2010:09:25	05:00	31.4	258.0	159.7	19:03	4.0	73.7	153.3
2010:09:26	05:01	41.8	253.3	148.7	19:01	-1.5	63.3	142.2
2010:09:27	05:02	52.2	246.2	137.5	19:00	-7.2	52.7	130.8
2010:09:28	05:04	61.8	234.5	126.0	18:58	-12.8	41.8	119.2
2010:09:29	05:05	69.6	212.5	114.3	18:56	-18.2	30.2	107.4
2010:09:30	05:06	72.2	175.7	102.2	18:54	-23.1	17.7	95.2
2010:10:01	05:07	67.2	142.2	89.9	18:53	-27.1	4.1	82.7
2010:10:02	05:08	57.6	123.6	77.2	18:51	-30.0	349.3	69.8
2010:10:03	05:09	46.0	113.3	64.1	18:49	-31.2	333.4	56.5
2010:10:04	05:10	33.5	106.8	50.7	18:48	-30.5	317.1	42.9
2010:10:05	05:11	20.4	101.9	37.0	18:46	-27.9	301.0	29.2
2010:10:06	05:12	7.0	97.9	23.2	18:44	-23.5	285.8	15.5
2010:10:07	05:13	-6.4	94.1	9.9	18:42	-17.8	271.6	5.0
2010:10:08	05:14	-19.7	90.1	7.4	18:41	-11.2	258.5	14.1
2010:10:09	05:15	-32.5	85.3	19.8	18:39	-4.2	246.3	27.2
2010:10:10	05:17	-44.7	79.0	33.0	18:38	2.9	234.6	40.2
2010:10:11	05:18	-55.8	69.4	45.8	18:36	9.7	223.2	52.8
2010:10:12	05:19	-65.1	53.3	58.3	18:34	15.9	211.8	65.0
2010:10:13	05:20	-70.9	25.6	70.3	18:33	21.4	200.1	76.7
2010:10:14	05:21	-70.5	350.8	81.9	18:31	26.0	188.0	88.1
2010:10:15	05:22	-64.7	325.9	93.2	18:30	29.5	175.4	99.3
2010:10:16	05:23	-56.4	311.6	104.3	18:28	31.8	162.2	110.2
2010:10:17	05:24	-47.2	303.0	115.1	18:27	32.6	148.8	121.0
2010:10:18	05:25	-37.5	297.1	125.9	18:25	32.1	135.4	131.8
2010:10:19	05:26	-27.6	292.7	136.7	18:24	30.1	122.3	142.5
2010:10:20	05:27	-17.4	288.9	147.5	18:22	26.9	109.8	153.3
2010:10:21	05:28	-7.1	285.5	158.3	18:21	22.5	98.0	164.1
2010:10:22	05:30	3.3	282.2	168.9	18:19	17.2	87.0	173.9
2010:10:23	05:31	13.9	278.5	175.3	18:18	11.2	76.5	171.4
2010:10:24	05:32	24.5	274.3	166.6	18:17	4.6	66.3	160.7
2010:10:25	05:33	35.1	268.9	155.3	18:15	-2.3	56.4	149.2
2010:10:26	05:34	45.5	261.6	143.6	18:14	-9.4	46.2	137.4
2010:10:27	05:35	55.3	250.3	131.7	18:13	-16.4	35.6	125.3
2010:10:28	05:36	63.3	231.9	119.5	18:12	-23.0	24.1	113.0
2010:10:29	05:37	67.2	203.3	107.1	18:10	-29.0	11.4	100.5
2010:10:30	05:38	64.8	172.0	94.4	18:09	-33.9	357.2	87.7
2010:10:31	05:39	57.2	150.0	81.4	18:08	-37.0	341.2	74.6
2010:11:01	05:41	46.8	136.4	68.2	18:07	-38.1	324.2	61.3
2010:11:02	05:42	35.2	127.4	54.8	18:06	-36.6	306.9	47.9
2010:11:03	05:43	22.9	120.7	41.3	18:04	-32.9	290.7	34.3
2010:11:04	05:44	10.4	115.1	27.7	18:03	-27.2	276.0	20.8
2010:11:05	05:45	-2.1	109.9	14.3	18:02	-20.1	263.0	7.9
2010:11:06	05:46	-14.4	104.5	3.9	18:01	-12.3	251.4	7.6
2010:11:07	05:47	-26.1	98.5	13.5	18:00	-4.1	240.7	19.9
2010:11:08	05:48	-37.1	91.2	26.1	17:59	4.1	230.6	32.4
2010:11:09	05:49	-47.0	81.6	38.5	17:58	12.1	220.7	44.6
2010:11:10	05:50	-55.4	68.3	50.5	17:57	19.5	210.5	56.5
2010:11:11	05:52	-61.3	49.5	62.2	17:57	26.2	199.8	67.9
2010:11:12	05:53	-63.5	26.0	73.5	17:56	32.0	188.3	79.1
2010:11:13	05:54	-61.5	2.8	84.6	17:55	36.5	175.6	90.1
2010:11:14	05:55	-56.3	344.7	95.5	17:54	39.6	161.9	100.9
2010:11:15	05:56	-49.1	331.8	106.4	17:53	41.0	147.2	111.7
2010:11:16	05:57	-40.9	322.3	117.2	17:53	40.4	132.4	122.6
2010:11:17	05:58	-32.0	314.9	128.1	17:52	38.0	118.1	133.5
2010:11:18	05:59	-22.7	308.7	139.1	17:51	33.8	104.9	144.6
2010:11:19	06:00	-13.0	303.1	150.3	17:51	28.2	92.9	155.9
2010:11:20	06:01	-3.0	297.7	161.6	17:50	21.3	82.1	167.3
2010:11:21	06:02	7.1	292.0	173.0	17:49	13.6	72.3	177.1
2010:11:22	06:03	17.3	285.7	173.7	17:49	5.3	63.0	168.1
2010:11:23	06:04	27.4	278.3	162.0	17:48	-3.5	54.0	156.0
2010:11:24	06:05	37.0	269.0	149.6	17:48	-12.4	44.9	143.5
2010:11:25	06:06	45.6	256.7	137.1	17:47	-21.2	35.1	130.9
2010:11:26	06:07	52.4	240.0	124.3	17:47	-29.6	24.2	118.1
2010:11:27	06:08	55.9	218.6	111.4	17:47	-37.1	11.4	105.1
2010:11:28	06:09	55.1	195.4	98.4	17:46	-43.1	356.2	92.1
2010:11:29	06:10	50.1	175.2	85.3	17:46	-46.8	338.3	79.0
2010:11:30	06:11	42.4	159.6	72.2	17:46	-47.4	318.9	65.8
2010:12:01	06:12	33.0	147.8	59.0	17:46	-44.8	300.1	52.6
2010:12:02	06:13	22.7	138.3	45.8	17:45	-39.5	283.8	39.4
2010:12:03	06:14	12.2	130.1	32.6	17:45	-32.2	270.3	26.4
2010:12:04	06:15	1.6	122.5	19.6	17:45	-23.7	259.2	13.5
2010:12:05	06:16	-8.7	115.0	6.9	17:45	-14.6	249.7	1.8
2010:12:06	06:17	-18.5	107.1	6.2	17:45	-5.2	241.2	12.0
2010:12:07	06:18	-27.6	98.3	18.3	17:45	4.2	233.3	24.0
2010:12:08	06:19	-35.7	88.1	30.2	17:45	13.4	225.6	35.8
2010:12:09	06:19	-42.4	76.1	41.9	17:45	22.2	217.5	47.3
2010:12:10	06:20	-47.3	62.0	53.2	17:45	30.5	208.7	58.5
2010:12:11	06:21	-50.1	45.9	64.3	17:45	38.0	198.6	69.6
2010:12:12	06:22	-50.4	29.1	75.3	17:46	44.4	186.5	80.4
2010:12:13	06:22	-48.4	13.0	86.1	17:46	49.2	172.1	91.2
2010:12:14	06:23	-44.3	358.7	96.9	17:46	51.9	155.2	102.1
2010:12:15	06:24	-38.7	346.4	107.8	17:46	51.8	137.1	113.0
2010:12:16	06:24	-32.0	335.8	118.9	17:47	48.9	119.8	124.2
2010:12:17	06:25	-24.4	326.4	130.2	17:47	43.6	104.9	135.6
2010:12:18	06:26	-16.3	317.8	141.7	17:47	36.3	92.6	147.3
2010:12:19	06:26	-7.7	309.5	153.6	17:48	27.6	82.5	159.4
2010:12:20	06:27	1.2	301.1	165.9	17:48	17.9	73.9	171.8
2010:12:21	06:27	10.2	292.2	178.4	17:49	7.5	66.3	175.5

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:12:22	06:28	19.0	282.4	168.6	17:49	-3.3	59.0	162.5
2010:12:23	06:28	27.1	271.1	155.6	17:50	-14.3	51.7	149.3
2010:12:24	06:29	34.1	257.8	142.3	17:50	-25.3	43.8	136.0
2010:12:25	06:29	39.4	242.3	129.0	17:51	-35.7	34.5	122.7
2010:12:26	06:30	42.2	224.9	115.7	17:51	-45.3	22.7	109.5
2010:12:27	06:30	42.1	206.7	102.5	17:52	-53.2	6.8	96.3
2010:12:28	06:30	39.3	189.5	89.4	17:53	-58.1	345.6	83.2
2010:12:29	06:31	34.3	174.2	76.4	17:53	-58.7	321.2	70.2
2010:12:30	06:31	27.7	161.0	63.5	17:54	-54.8	299.2	57.4
2010:12:31	06:31	20.3	149.5	50.8	17:55	-47.8	282.7	44.8

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza della Luna sull'orizzonte, in °

Az = azimut della Luna, in °

Elong = elongazione della Luna, in °

Alt = altitude of the Moon above the horizon, in °

Az = azimuth of the Moon, in °

Elong = elongation of the Moon, in °

Altezza ai crepuscoli. Il Sole è 18° sotto l'orizzonte

Altitude in the twilights. The Sun is 18° under the horizon

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:01:01	05:57	21.4	281.3	174.3	18:30	5.9	67.9	167.0
2010:01:02	05:58	29.9	268.4	160.3	18:30	-6.8	61.9	152.9
2010:01:03	05:58	36.7	253.4	146.2	18:31	-19.4	55.8	138.9
2010:01:04	05:58	41.1	236.1	132.4	18:32	-31.5	49.0	125.3
2010:01:05	05:58	42.5	217.6	118.9	18:33	-42.8	40.7	111.9
2010:01:06	05:58	41.0	199.7	105.7	18:34	-53.0	29.2	99.0
2010:01:07	05:58	37.0	183.8	93.0	18:35	-61.2	12.2	86.4
2010:01:08	05:58	31.4	170.1	80.6	18:36	-65.8	347.3	74.3
2010:01:09	05:58	24.7	158.4	68.6	18:36	-65.3	319.0	62.4
2010:01:10	05:58	17.5	148.2	56.9	18:37	-60.2	296.6	50.8
2010:01:11	05:58	10.1	138.8	45.4	18:38	-52.5	281.9	39.4
2010:01:12	05:57	2.7	130.0	34.1	18:39	-43.6	272.2	28.2
2010:01:13	05:57	-4.5	121.3	22.9	18:40	-34.1	265.4	17.1
2010:01:14	05:57	-11.5	112.5	11.9	18:41	-24.2	260.2	6.1
2010:01:15	05:57	-18.0	103.2	1.1	18:42	-14.3	256.0	4.8
2010:01:16	05:56	-23.9	93.3	9.9	18:43	-4.2	252.2	15.6
2010:01:17	05:56	-29.1	82.5	20.7	18:44	5.9	248.7	26.4
2010:01:18	05:56	-33.2	70.7	31.5	18:45	16.1	245.1	37.3
2010:01:19	05:55	-36.1	57.8	42.3	18:46	26.3	241.2	48.1
2010:01:20	05:55	-37.6	44.1	53.2	18:47	36.5	236.4	59.1
2010:01:21	05:54	-37.5	30.0	64.3	18:48	46.6	229.9	70.3
2010:01:22	05:54	-35.7	16.0	75.5	18:49	56.3	220.1	81.7
2010:01:23	05:53	-32.5	2.4	87.0	18:50	64.8	203.4	93.4
2010:01:24	05:53	-27.9	349.6	98.9	18:51	70.0	174.1	105.5
2010:01:25	05:52	-22.1	337.4	111.2	18:53	68.2	138.5	118.1
2010:01:26	05:52	-15.4	325.6	124.0	18:54	60.3	114.0	131.1
2010:01:27	05:51	-8.0	314.1	137.2	18:55	49.1	100.3	144.6
2010:01:28	05:50	-0.2	302.5	150.9	18:56	36.6	91.9	158.5
2010:01:29	05:49	7.7	290.5	164.9	18:57	23.2	86.1	172.6
2010:01:30	05:49	15.2	277.7	178.1	18:58	9.6	81.6	172.7
2010:01:31	05:48	21.8	263.8	166.3	18:59	-3.9	77.7	158.6
2010:02:01	05:47	27.0	248.9	152.3	19:00	-17.2	73.8	144.6
2010:02:02	05:46	30.3	233.0	138.5	19:01	-30.0	69.5	131.0
2010:02:03	05:45	31.6	216.9	125.1	19:02	-42.2	64.1	117.8
2010:02:04	05:44	30.9	201.2	112.1	19:04	-53.5	56.4	105.1
2010:02:05	05:43	28.5	186.6	99.6	19:05	-63.6	43.7	92.9
2010:02:06	05:42	24.9	173.2	87.6	19:06	-71.1	20.5	81.0
2010:02:07	05:41	20.3	161.0	75.9	19:07	-73.2	344.0	69.5
2010:02:08	05:40	15.2	149.9	64.5	19:08	-68.7	312.8	58.3
2010:02:09	05:39	9.8	139.4	53.4	19:09	-60.8	295.4	47.2
2010:02:10	05:38	4.2	129.4	42.4	19:10	-51.5	285.8	36.3
2010:02:11	05:37	-1.3	119.6	31.6	19:11	-41.7	279.7	25.5
2010:02:12	05:36	-6.8	109.8	20.8	19:13	-31.7	275.5	14.8
2010:02:13	05:35	-11.9	99.7	10.2	19:14	-21.5	272.2	4.7
2010:02:14	05:34	-16.7	89.3	3.1	19:15	-11.1	269.5	7.8
2010:02:15	05:32	-20.9	78.3	12.2	19:16	-0.6	266.9	18.3
2010:02:16	05:31	-24.5	66.7	22.9	19:17	9.9	264.4	29.2
2010:02:17	05:30	-27.1	54.5	33.9	19:18	20.6	261.6	40.3
2010:02:18	05:28	-28.7	41.6	45.0	19:19	31.4	258.2	51.5
2010:02:19	05:27	-29.2	28.2	56.3	19:21	42.3	253.6	63.0
2010:02:20	05:26	-28.4	14.7	67.9	19:22	53.1	246.6	74.7
2010:02:21	05:24	-26.4	1.1	79.7	19:23	63.3	234.3	86.7
2010:02:22	05:23	-23.2	347.8	91.9	19:24	71.4	209.1	99.1
2010:02:23	05:22	-19.0	334.7	104.4	19:25	72.9	166.3	112.0
2010:02:24	05:20	-13.8	321.8	117.4	19:26	65.7	133.6	125.2
2010:02:25	05:19	-8.0	309.0	130.8	19:28	54.4	117.6	138.8
2010:02:26	05:17	-1.7	296.2	144.5	19:29	41.6	108.9	152.7
2010:02:27	05:16	4.6	283.1	158.4	19:30	28.2	103.4	166.6
2010:02:28	05:14	10.7	269.6	171.9	19:31	14.5	99.2	175.8
2010:03:01	05:13	16.0	255.6	171.9	19:32	1.0	95.6	164.1
2010:03:02	05:11	20.3	241.0	158.7	19:33	-12.1	92.2	150.6
2010:03:03	05:09	23.3	226.1	145.2	19:35	-24.8	88.5	137.3
2010:03:04	05:08	24.8	211.1	132.2	19:36	-36.8	83.9	124.5
2010:03:05	05:06	24.8	196.5	119.5	19:37	-48.0	77.8	112.1
2010:03:06	05:04	23.6	182.6	107.4	19:38	-58.3	68.4	100.2
2010:03:07	05:03	21.3	169.4	95.6	19:39	-66.9	52.4	88.6
2010:03:08	05:01	18.2	157.1	84.2	19:41	-72.2	24.5	77.4
2010:03:09	04:59	14.4	145.6	73.1	19:42	-71.6	349.6	66.4
2010:03:10	04:58	10.3	134.6	62.2	19:43	-65.8	324.8	55.5
2010:03:11	04:56	5.9	124.0	51.4	19:44	-57.6	310.7	44.7
2010:03:12	04:54	1.4	113.6	40.6	19:45	-48.3	302.3	34.0
2010:03:13	04:53	-3.1	103.2	29.9	19:47	-38.5	296.7	23.3
2010:03:14	04:51	-7.6	92.7	19.3	19:48	-28.5	292.4	12.8
2010:03:15	04:49	-11.9	81.9	9.0	19:49	-18.1	288.9	4.7
2010:03:16	04:47	-15.8	70.7	5.7	19:50	-7.6	285.7	11.3
2010:03:17	04:45	-19.2	59.0	15.2	19:51	3.1	282.4	22.1
2010:03:18	04:44	-21.9	46.7	26.3	19:53	14.0	279.0	33.5
2010:03:19	04:42	-23.8	33.8	37.7	19:54	25.0	274.9	45.1
2010:03:20	04:40	-24.8	20.4	49.4	19:55	35.9	269.7	57.0
2010:03:21	04:38	-24.6	6.7	61.4	19:56	46.7	262.2	69.1
2010:03:22	04:36	-23.3	352.9	73.6	19:58	56.9	250.5	81.5
2010:03:23	04:34	-21.0	339.1	86.0	19:59	65.1	230.1	94.2
2010:03:24	04:32	-17.6	325.5	98.8	20:00	68.4	197.6	107.3
2010:03:25	04:30	-13.3	312.1	111.9	20:02	64.4	165.2	120.6
2010:03:26	04:29	-8.4	298.8	125.3	20:03	55.2	144.7	134.1
2010:03:27	04:27	-3.0	285.6	138.9	20:04	43.8	132.7	147.8

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:03:28	04:25	2.5	272.3	152.6	20:06	31.4	124.7	161.4
2010:03:29	04:23	7.8	258.8	165.9	20:07	18.8	118.7	173.5
2010:03:30	04:21	12.6	245.1	175.0	20:08	6.3	113.6	169.3
2010:03:31	04:19	16.7	231.2	165.1	20:10	-5.9	108.8	156.7
2010:04:01	04:17	19.7	217.0	152.4	20:11	-17.6	103.8	144.0
2010:04:02	04:15	21.5	202.8	139.8	20:12	-28.7	98.2	131.6
2010:04:03	04:13	22.2	188.9	127.5	20:14	-38.9	91.3	119.6
2010:04:04	04:11	21.8	175.4	115.7	20:15	-48.2	82.2	108.0
2010:04:05	04:09	20.4	162.4	104.2	20:16	-56.0	69.6	96.7
2010:04:06	04:07	18.2	150.1	93.0	20:18	-61.7	51.9	85.6
2010:04:07	04:05	15.3	138.4	82.0	20:19	-64.1	29.1	74.7
2010:04:08	04:03	12.0	127.1	71.2	20:21	-62.5	5.9	63.9
2010:04:09	04:01	8.2	116.2	60.4	20:22	-57.5	347.3	53.1
2010:04:10	03:59	4.1	105.4	49.7	20:24	-50.5	333.8	42.2
2010:04:11	03:57	-0.1	94.8	38.8	20:25	-42.2	324.0	31.3
2010:04:12	03:55	-4.4	84.0	27.9	20:26	-33.1	316.4	20.3
2010:04:13	03:53	-8.7	72.9	16.9	20:28	-23.5	310.1	9.7
2010:04:14	03:51	-12.8	61.4	6.9	20:29	-13.5	304.4	5.9
2010:04:15	03:49	-16.5	49.4	8.5	20:31	-3.2	298.9	16.0
2010:04:16	03:47	-19.6	36.8	19.4	20:32	7.2	293.2	27.7
2010:04:17	03:45	-22.0	23.6	31.3	20:34	17.5	286.8	39.9
2010:04:18	03:43	-23.5	9.8	43.5	20:35	27.7	279.3	52.3
2010:04:19	03:41	-23.8	355.6	56.0	20:37	37.4	269.8	64.9
2010:04:20	03:39	-23.0	341.3	68.6	20:38	46.0	257.2	77.7
2010:04:21	03:37	-21.0	327.1	81.5	20:40	52.6	240.0	90.7
2010:04:22	03:35	-18.0	313.1	94.5	20:42	55.8	218.1	103.9
2010:04:23	03:34	-14.1	299.5	107.7	20:43	54.5	194.8	117.2
2010:04:24	03:32	-9.4	286.1	121.0	20:45	49.1	175.0	130.5
2010:04:25	03:30	-4.4	273.1	134.3	20:46	41.1	159.8	143.9
2010:04:26	03:28	0.9	260.2	147.6	20:48	31.5	148.3	157.1
2010:04:27	03:26	6.1	247.3	160.7	20:50	21.4	139.0	169.7
2010:04:28	03:24	10.9	234.3	172.8	20:51	11.1	131.1	174.0
2010:04:29	03:22	15.1	221.1	171.3	20:53	1.0	123.7	162.8
2010:04:30	03:20	18.5	207.8	159.5	20:54	-8.7	116.4	150.7
2010:05:01	03:18	20.9	194.3	147.5	20:56	-17.8	108.8	138.8
2010:05:02	03:16	22.3	181.0	135.7	20:58	-26.1	100.6	127.1
2010:05:03	03:14	22.7	167.8	124.1	20:59	-33.5	91.2	115.8
2010:05:04	03:13	22.0	155.0	112.9	21:01	-39.8	80.3	104.7
2010:05:05	03:11	20.5	142.6	101.9	21:03	-44.7	67.6	93.7
2010:05:06	03:09	18.2	130.7	91.0	21:04	-47.8	53.0	82.9
2010:05:07	03:07	15.2	119.2	80.1	21:06	-48.8	37.3	72.0
2010:05:08	03:05	11.6	108.1	69.3	21:08	-47.6	21.6	61.1
2010:05:09	03:04	7.6	97.1	58.3	21:09	-44.3	6.8	50.0
2010:05:10	03:02	3.2	86.3	47.2	21:11	-39.3	353.7	38.7
2010:05:11	03:00	-1.4	75.4	35.9	21:13	-33.0	342.2	27.1
2010:05:12	02:58	-6.2	64.2	24.3	21:14	-25.8	331.9	15.5
2010:05:13	02:57	-10.9	52.6	12.7	21:16	-17.8	322.5	4.8
2010:05:14	02:55	-15.4	40.5	3.9	21:18	-9.4	313.4	10.5
2010:05:15	02:53	-19.4	27.6	13.3	21:19	-0.8	304.4	22.8
2010:05:16	02:52	-22.7	13.9	25.8	21:21	7.8	295.1	35.6
2010:05:17	02:50	-24.9	359.6	38.6	21:23	16.0	285.0	48.7
2010:05:18	02:49	-25.9	344.8	51.6	21:24	23.6	273.8	61.8
2010:05:19	02:47	-25.6	329.8	64.8	21:26	30.1	261.1	75.0
2010:05:20	02:46	-23.9	315.1	77.9	21:27	35.0	246.7	88.2
2010:05:21	02:44	-20.9	300.8	91.1	21:29	37.9	230.9	101.4
2010:05:22	02:43	-16.9	287.2	104.3	21:30	38.5	214.3	114.5
2010:05:23	02:41	-12.1	274.2	117.4	21:32	36.8	198.0	127.6
2010:05:24	02:40	-6.8	261.7	130.4	21:34	33.1	183.0	140.5
2010:05:25	02:39	-1.2	249.6	143.2	21:35	28.0	169.5	153.3
2010:05:26	02:38	4.4	237.8	155.9	21:37	21.9	157.5	165.7
2010:05:27	02:36	9.8	225.9	168.3	21:38	15.3	146.7	176.6
2010:05:28	02:35	14.7	213.9	176.8	21:39	8.6	136.6	169.0
2010:05:29	02:34	19.0	201.7	166.6	21:41	2.0	127.0	157.4
2010:05:30	02:33	22.5	189.2	155.0	21:42	-4.4	117.6	145.8
2010:05:31	02:32	25.1	176.5	143.5	21:43	-10.3	108.2	134.5
2010:06:01	02:31	26.6	163.7	132.3	21:45	-15.7	98.5	123.4
2010:06:02	02:30	27.0	150.9	121.2	21:46	-20.5	88.4	112.4
2010:06:03	02:29	26.3	138.2	110.3	21:47	-24.6	77.8	101.6
2010:06:04	02:28	24.5	126.0	99.4	21:48	-27.9	66.5	90.7
2010:06:05	02:27	21.9	114.1	88.5	21:50	-30.2	54.5	79.7
2010:06:06	02:27	18.3	102.7	77.5	21:51	-31.5	41.9	68.5
2010:06:07	02:26	14.0	91.6	66.4	21:52	-31.6	28.8	57.1
2010:06:08	02:25	9.1	80.8	54.9	21:53	-30.5	15.5	45.4
2010:06:09	02:25	3.5	70.0	43.1	21:54	-28.2	2.1	33.3
2010:06:10	02:24	-2.4	59.2	31.0	21:55	-24.7	349.0	20.9
2010:06:11	02:24	-8.6	48.1	18.5	21:56	-20.3	336.2	8.2
2010:06:12	02:23	-14.8	36.4	5.9	21:56	-15.1	323.8	5.5
2010:06:13	02:23	-20.6	23.9	7.8	21:57	-9.4	311.5	18.6
2010:06:14	02:23	-25.8	10.4	21.1	21:58	-3.4	299.5	32.1
2010:06:15	02:23	-29.9	355.8	34.6	21:58	2.6	287.3	45.7
2010:06:16	02:22	-32.4	340.2	48.2	21:59	8.2	275.0	59.2
2010:06:17	02:22	-33.2	324.2	61.7	21:59	13.4	262.4	72.6
2010:06:18	02:22	-32.0	308.5	75.1	22:00	17.8	249.4	85.9
2010:06:19	02:22	-29.1	293.6	88.3	22:00	21.2	235.9	98.9
2010:06:20	02:23	-24.7	279.9	101.3	22:01	23.5	222.2	111.8
2010:06:21	02:23	-19.3	267.4	114.1	22:01	24.6	208.3	124.4
2010:06:22	02:23	-13.1	256.0	126.7	22:01	24.6	194.5	136.9
2010:06:23	02:23	-6.5	245.4	139.1	22:01	23.4	181.0	149.1
2010:06:24	02:24	0.3	235.3	151.3	22:01	21.4	168.1	161.1
2010:06:25	02:24	7.2	225.5	163.3	22:01	18.5	155.8	172.9

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:06:26	02:25	13.8	215.6	175.0	22:01	15.1	144.1	175.5
2010:06:27	02:25	20.1	205.5	173.4	22:01	11.3	132.9	164.1
2010:06:28	02:26	25.8	194.8	162.0	22:01	7.3	122.1	152.9
2010:06:29	02:26	30.7	183.4	150.9	22:00	3.1	111.7	141.9
2010:06:30	02:27	34.6	171.1	139.8	22:00	-1.1	101.4	130.9
2010:07:01	02:28	37.2	158.0	128.9	22:00	-5.2	91.2	120.0
2010:07:02	02:29	38.3	144.3	118.0	21:59	-9.2	80.8	109.1
2010:07:03	02:30	37.9	130.5	107.1	21:59	-12.9	70.1	98.2
2010:07:04	02:31	35.7	117.0	96.1	21:58	-16.3	59.0	87.0
2010:07:05	02:32	32.1	104.4	84.9	21:58	-19.3	47.3	75.6
2010:07:06	02:33	27.0	92.6	73.4	21:57	-21.7	34.9	63.9
2010:07:07	02:34	20.7	81.8	61.6	21:56	-23.4	21.8	51.8
2010:07:08	02:35	13.4	71.8	49.4	21:55	-24.1	7.9	39.3
2010:07:09	02:36	5.3	62.2	36.8	21:54	-23.7	353.6	26.3
2010:07:10	02:37	-3.5	52.7	23.7	21:54	-22.2	338.9	13.0
2010:07:11	02:38	-12.6	43.0	10.3	21:53	-19.5	324.3	1.0
2010:07:12	02:40	-21.7	32.6	3.6	21:52	-15.8	310.1	14.7
2010:07:13	02:41	-30.4	20.9	17.5	21:51	-11.3	296.2	28.6
2010:07:14	02:42	-38.0	7.3	31.5	21:49	-6.3	282.8	42.5
2010:07:15	02:44	-43.8	351.1	45.3	21:48	-1.1	269.7	56.2
2010:07:16	02:45	-47.1	332.7	59.0	21:47	4.0	256.9	69.7
2010:07:17	02:47	-47.2	313.6	72.4	21:46	8.8	244.2	82.8
2010:07:18	02:48	-44.3	295.9	85.5	21:45	13.1	231.5	95.6
2010:07:19	02:49	-39.0	280.9	98.2	21:43	16.7	218.7	108.0
2010:07:20	02:51	-32.2	268.6	110.7	21:42	19.5	205.7	120.2
2010:07:21	02:52	-24.5	258.6	122.8	21:40	21.4	192.7	132.1
2010:07:22	02:54	-16.2	250.0	134.7	21:39	22.3	179.6	143.8
2010:07:23	02:55	-7.6	242.4	146.3	21:38	22.3	166.7	155.3
2010:07:24	02:57	1.2	235.4	157.8	21:36	21.3	154.0	166.5
2010:07:25	02:59	9.9	228.7	169.0	21:35	19.5	141.8	177.1
2010:07:26	03:00	18.6	221.7	178.1	21:33	17.0	129.9	170.9
2010:07:27	03:02	26.9	214.3	168.5	21:31	13.8	118.5	160.1
2010:07:28	03:03	34.9	205.8	157.6	21:30	10.2	107.5	149.2
2010:07:29	03:05	42.1	195.7	146.7	21:28	6.2	96.8	138.4
2010:07:30	03:06	48.3	183.2	135.8	21:26	1.9	86.3	127.5
2010:07:31	03:08	52.8	167.8	124.9	21:25	-2.5	75.8	116.6
2010:08:01	03:10	54.8	149.6	113.9	21:23	-6.9	65.1	105.5
2010:08:02	03:11	53.9	130.7	102.8	21:21	-11.3	54.0	94.2
2010:08:03	03:13	49.9	113.6	91.3	21:20	-15.4	42.4	82.5
2010:08:04	03:15	43.4	99.5	79.6	21:18	-19.1	30.0	70.5
2010:08:05	03:16	35.2	88.3	67.5	21:16	-22.2	16.6	58.1
2010:08:06	03:18	25.6	79.2	54.9	21:14	-24.4	2.3	45.2
2010:08:07	03:19	14.9	71.4	41.9	21:12	-25.4	347.2	31.9
2010:08:08	03:21	3.5	64.5	28.4	21:10	-24.8	331.5	18.2
2010:08:09	03:23	-8.3	57.8	14.7	21:09	-22.8	315.9	4.9
2010:08:10	03:24	-20.3	50.7	3.0	21:07	-19.4	300.7	10.7
2010:08:11	03:26	-32.2	42.6	14.4	21:05	-14.8	286.1	24.7
2010:08:12	03:27	-43.3	32.4	28.4	21:03	-9.5	272.3	38.6
2010:08:13	03:29	-53.0	18.2	42.3	21:01	-3.9	259.3	52.3
2010:08:14	03:30	-60.0	357.8	55.9	20:59	1.9	246.7	65.6
2010:08:15	03:32	-62.5	331.6	69.1	20:57	7.3	234.4	78.4
2010:08:16	03:33	-59.9	306.4	81.9	20:55	12.3	222.2	90.9
2010:08:17	03:35	-53.5	287.9	94.2	20:53	16.7	209.9	102.9
2010:08:18	03:37	-45.2	275.4	106.2	20:51	20.3	197.4	114.6
2010:08:19	03:38	-36.0	266.7	117.9	20:49	23.0	184.8	126.1
2010:08:20	03:40	-26.4	260.2	129.3	20:47	24.6	171.9	137.3
2010:08:21	03:41	-16.6	255.0	140.5	20:45	25.2	159.0	148.4
2010:08:22	03:43	-6.7	250.5	151.6	20:43	24.7	146.2	159.2
2010:08:23	03:44	3.2	246.3	162.4	20:41	23.2	133.7	169.7
2010:08:24	03:45	13.1	242.2	172.6	20:39	20.7	121.6	175.8
2010:08:25	03:47	23.0	237.9	173.9	20:37	17.4	110.0	167.1
2010:08:26	03:48	32.7	232.8	164.0	20:35	13.5	98.9	156.6
2010:08:27	03:50	42.3	226.5	153.3	20:33	9.0	88.1	145.8
2010:08:28	03:51	51.4	217.9	142.5	20:31	4.1	77.6	134.8
2010:08:29	03:53	59.6	204.8	131.4	20:29	-1.1	67.1	123.7
2010:08:30	03:54	65.6	184.3	120.3	20:27	-6.4	56.4	112.4
2010:08:31	03:55	67.5	155.9	108.9	20:25	-11.6	45.4	100.9
2010:09:01	03:57	63.9	128.7	97.2	20:23	-16.7	33.7	89.0
2010:09:02	03:58	56.2	110.0	85.2	20:21	-21.3	21.1	76.7
2010:09:03	04:00	46.2	98.2	72.7	20:19	-25.1	7.4	64.0
2010:09:04	04:01	34.9	90.2	59.9	20:17	-27.9	352.4	50.9
2010:09:05	04:02	22.7	84.3	46.6	20:15	-29.0	336.5	37.4
2010:09:06	04:04	9.9	79.4	32.9	20:13	-28.4	320.1	23.6
2010:09:07	04:05	-3.3	75.0	19.1	20:11	-25.9	303.9	10.1
2010:09:08	04:06	-16.7	70.5	6.3	20:09	-21.7	288.5	7.0
2010:09:09	04:08	-29.8	65.4	11.0	20:07	-16.3	274.2	20.0
2010:09:10	04:09	-42.6	58.9	24.6	20:05	-10.1	260.8	33.6
2010:09:11	04:10	-54.4	49.3	38.2	20:03	-3.5	248.3	47.0
2010:09:12	04:11	-64.5	32.9	51.5	20:01	3.0	236.4	60.0
2010:09:13	04:13	-70.8	3.9	64.4	19:59	9.2	224.8	72.6
2010:09:14	04:14	-70.1	327.4	76.8	19:57	14.9	213.1	84.7
2010:09:15	04:15	-63.7	302.2	88.7	19:55	19.9	201.3	96.3
2010:09:16	04:16	-54.8	288.4	100.3	19:53	24.0	189.1	107.7
2010:09:17	04:18	-45.1	280.3	111.6	19:51	27.1	176.5	118.8
2010:09:18	04:19	-35.1	274.8	122.7	19:50	29.1	163.5	129.8
2010:09:19	04:20	-25.0	270.8	133.6	19:48	29.7	150.3	140.6
2010:09:20	04:21	-14.8	267.5	144.4	19:46	29.1	137.2	151.3
2010:09:21	04:22	-4.5	264.6	155.1	19:44	27.2	124.4	161.9
2010:09:22	04:24	5.8	261.8	165.6	19:42	24.2	112.1	171.8
2010:09:23	04:25	16.2	258.9	174.4	19:40	20.2	100.4	173.4

Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:09:24	04:26	26.7	255.6	170.3	19:38	15.3	89.4	163.9
2010:09:25	04:27	37.1	251.5	160.0	19:36	9.9	78.8	153.1
2010:09:26	04:28	47.4	245.7	149.0	19:34	3.9	68.4	141.9
2010:09:27	04:30	57.4	236.8	137.7	19:33	-2.3	58.2	130.6
2010:09:28	04:31	66.3	220.8	126.3	19:31	-8.7	47.8	119.0
2010:09:29	04:32	71.9	191.3	114.5	19:29	-15.0	36.9	107.1
2010:09:30	04:33	70.6	153.3	102.5	19:27	-21.0	25.1	94.9
2010:10:01	04:34	63.0	127.8	90.2	19:25	-26.4	12.2	82.4
2010:10:02	04:35	52.5	114.2	77.5	19:24	-30.7	357.8	69.5
2010:10:03	04:36	40.6	106.1	64.4	19:22	-33.5	342.0	56.2
2010:10:04	04:37	27.8	100.6	51.0	19:20	-34.3	325.1	42.6
2010:10:05	04:39	14.7	96.3	37.3	19:18	-32.8	308.0	28.8
2010:10:06	04:40	1.3	92.5	23.5	19:17	-29.1	291.8	15.2
2010:10:07	04:41	-12.1	88.8	10.2	19:15	-23.7	276.9	5.0
2010:10:08	04:42	-25.4	84.7	7.1	19:13	-17.0	263.4	14.4
2010:10:09	04:43	-38.1	79.5	19.5	19:12	-9.6	251.2	27.5
2010:10:10	04:44	-50.1	72.2	32.7	19:10	-2.0	239.8	40.5
2010:10:11	04:45	-60.9	60.3	45.5	19:08	5.5	229.0	53.1
2010:10:12	04:46	-69.2	38.7	58.0	19:07	12.6	218.3	65.2
2010:10:13	04:47	-72.4	3.7	70.0	19:05	19.1	207.4	77.0
2010:10:14	04:49	-68.7	331.1	81.7	19:04	24.9	196.0	88.4
2010:10:15	04:50	-61.0	312.2	93.0	19:02	29.6	184.0	99.5
2010:10:16	04:51	-51.9	301.6	104.0	19:00	33.2	171.2	110.4
2010:10:17	04:52	-42.2	294.9	114.9	18:59	35.4	157.6	121.3
2010:10:18	04:53	-32.3	290.2	125.7	18:57	36.0	143.6	132.0
2010:10:19	04:54	-22.2	286.5	136.5	18:56	35.0	129.7	142.8
2010:10:20	04:55	-11.9	283.2	147.3	18:55	32.4	116.3	153.6
2010:10:21	04:56	-1.5	280.1	158.1	18:53	28.4	103.7	164.3
2010:10:22	04:57	9.0	277.0	168.7	18:52	23.1	92.1	174.0
2010:10:23	04:58	19.6	273.4	175.3	18:50	17.0	81.3	171.2
2010:10:24	04:59	30.3	269.1	166.8	18:49	10.1	71.2	160.4
2010:10:25	05:01	41.0	263.4	155.6	18:48	2.7	61.5	148.9
2010:10:26	05:02	51.3	255.0	143.9	18:46	-5.0	51.8	137.1
2010:10:27	05:03	60.6	241.3	131.9	18:45	-12.8	41.9	125.0
2010:10:28	05:04	67.5	217.6	119.8	18:44	-20.4	31.3	112.7
2010:10:29	05:05	68.7	183.8	107.3	18:43	-27.5	19.6	100.2
2010:10:30	05:06	63.3	155.0	94.7	18:41	-33.8	6.2	87.4
2010:10:31	05:07	53.8	137.7	81.7	18:40	-38.6	350.7	74.3
2010:11:01	05:08	42.5	127.1	68.5	18:39	-41.2	333.3	61.0
2010:11:02	05:09	30.4	119.9	55.1	18:38	-41.1	315.1	47.6
2010:11:03	05:10	17.8	114.3	41.6	18:37	-38.2	297.5	34.0
2010:11:04	05:11	5.0	109.4	28.0	18:36	-33.0	281.7	20.5
2010:11:05	05:12	-7.6	104.7	14.6	18:35	-26.0	268.0	7.7
2010:11:06	05:13	-20.0	99.6	4.0	18:34	-17.9	256.2	7.8
2010:11:07	05:15	-31.8	93.6	13.2	18:33	-9.3	245.7	20.2
2010:11:08	05:16	-42.9	85.8	25.8	18:32	-0.6	236.0	32.7
2010:11:09	05:17	-52.7	75.0	38.2	18:31	8.0	226.8	44.9
2010:11:10	05:18	-60.6	58.9	50.3	18:30	16.2	217.5	56.7
2010:11:11	05:19	-65.3	35.8	61.9	18:29	23.9	207.8	68.2
2010:11:12	05:20	-65.3	9.1	73.3	18:28	30.7	197.2	79.4
2010:11:13	05:21	-61.0	346.9	84.4	18:28	36.6	185.5	90.4
2010:11:14	05:22	-54.2	331.5	95.3	18:27	41.1	172.2	101.2
2010:11:15	05:23	-46.0	321.0	106.1	18:26	43.9	157.5	112.0
2010:11:16	05:24	-37.0	313.4	116.9	18:26	44.7	141.8	122.8
2010:11:17	05:25	-27.6	307.3	127.8	18:25	43.2	126.2	133.7
2010:11:18	05:26	-17.9	302.1	138.8	18:24	39.6	111.6	144.8
2010:11:19	05:27	-7.9	297.2	150.0	18:24	34.2	98.5	156.1
2010:11:20	05:28	2.3	292.3	161.4	18:23	27.4	87.2	167.5
2010:11:21	05:29	12.7	287.0	172.7	18:23	19.4	77.1	177.1
2010:11:22	05:30	23.1	280.9	174.0	18:22	10.7	68.0	167.9
2010:11:23	05:31	33.3	273.4	162.3	18:22	1.5	59.4	155.7
2010:11:24	05:32	43.0	263.4	149.9	18:21	-8.0	50.9	143.2
2010:11:25	05:33	51.4	249.4	137.4	18:21	-17.6	42.1	130.6
2010:11:26	05:34	57.4	229.7	124.6	18:20	-26.9	32.3	117.8
2010:11:27	05:35	59.2	205.1	111.7	18:20	-35.6	21.0	104.8
2010:11:28	05:36	56.1	181.2	98.7	18:20	-43.1	7.1	91.8
2010:11:29	05:37	49.1	162.7	85.6	18:20	-48.5	349.9	78.7
2010:11:30	05:38	39.8	149.3	72.5	18:19	-51.0	329.7	65.5
2010:12:01	05:39	29.4	139.3	59.3	18:19	-49.8	309.0	52.3
2010:12:02	05:40	18.5	131.1	46.1	18:19	-45.3	290.7	39.1
2010:12:03	05:41	7.4	123.9	32.9	18:19	-38.2	275.9	26.1
2010:12:04	05:41	-3.6	117.0	19.9	18:19	-29.7	264.1	13.2
2010:12:05	05:42	-14.3	110.0	7.2	18:19	-20.3	254.5	1.8
2010:12:06	05:43	-24.3	102.2	5.9	18:19	-10.5	246.3	12.2
2010:12:07	05:44	-33.6	93.2	18.0	18:19	-0.8	239.0	24.3
2010:12:08	05:45	-41.7	82.4	30.0	18:19	8.9	231.9	36.1
2010:12:09	05:46	-48.2	69.0	41.6	18:19	18.3	224.8	47.6
2010:12:10	05:46	-52.5	52.8	53.0	18:19	27.2	217.2	58.8
2010:12:11	05:47	-54.1	34.6	64.1	18:19	35.6	208.4	69.8
2010:12:12	05:48	-52.9	16.6	75.0	18:20	43.2	197.9	80.7
2010:12:13	05:49	-49.2	0.7	85.9	18:20	49.5	184.9	91.5
2010:12:14	05:49	-43.7	347.4	96.7	18:20	53.9	168.5	102.3
2010:12:15	05:50	-36.9	336.4	107.6	18:20	55.6	149.3	113.3
2010:12:16	05:51	-29.2	327.2	118.6	18:21	54.1	129.7	124.4
2010:12:17	05:51	-20.8	319.0	129.9	18:21	49.5	112.4	135.9
2010:12:18	05:52	-12.0	311.3	141.5	18:21	42.4	98.5	147.6
2010:12:19	05:52	-2.8	303.7	153.4	18:22	33.7	87.6	159.7
2010:12:20	05:53	6.6	295.9	165.6	18:22	23.8	78.8	172.1
2010:12:21	05:53	16.0	287.3	178.2	18:23	13.1	71.3	175.2
2010:12:22	05:54	25.0	277.4	169.0	18:23	2.0	64.5	162.2



Date	Morning twilight				Evening twilight			
	Times	Alt	Az	Elong	Times	Alt	Az	Elong
2010:12:23	05:54	33.3	265.6	155.9	18:24	-9.5	58.0	149.0
2010:12:24	05:55	40.1	251.2	142.6	18:24	-20.9	51.1	135.7
2010:12:25	05:55	44.7	234.0	129.3	18:25	-32.1	43.2	122.4
2010:12:26	05:56	46.3	214.8	116.1	18:25	-42.6	33.3	109.2
2010:12:27	05:56	44.5	195.8	102.8	18:26	-51.9	19.9	96.0
2010:12:28	05:56	39.9	178.9	89.7	18:27	-58.9	0.7	82.9
2010:12:29	05:57	33.2	164.6	76.7	18:27	-61.9	335.5	69.9
2010:12:30	05:57	25.4	152.6	63.8	18:28	-59.8	309.8	57.1
2010:12:31	05:57	16.9	142.3	51.1	18:29	-53.6	290.1	44.5

Date = data nel formato aaaa/mm/gg

Times = ore

Morning twilights = crepuscolo mattutino

Evening twilight = crepuscolo serale

Alt = altezza della Luna sull'orizzonte, in °

Az = azimut della Luna, in °

Elong = elongazione della Luna, in °

Alt = altitude of the Moon above the horizon, in °

Az = azimuth of the Moon, in °

Elong = elongation of the Moon, in °

# EVENTI GEOCENTRICI <5° LUNA-PIANETI

## GEOCENTRIC EVENTS <5° MOON-PLANETS

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)		
2010/01/13	17:26:09	4.54877	1.15197	0.752	0.003	172	-18	0.3	-7.4		Mercury	Moon
2010/01/15	08:43:50	1.37293	1.14660	1.711	0.003	343	1	-3.9	-0.7		Venus	Moon
2010/01/17	19:51:48	3.37535	1.14474	30.892	0.003	336	28	8.0	-8.4		Neptune	Moon
2010/01/18	05:44:15	4.24410	1.14957	5.806	0.003	335	32	-2.0	-8.7		Jupiter	Moon
2010/02/12	04:06:37	2.18753	1.14323	1.230	0.003	341	-21	-0.1	-7.8		Mercury	Moon
2010/02/14	04:02:36	3.42030	1.14491	31.011	0.003	336	1	8.0	-3.6		Neptune	Moon
2010/02/14	20:04:47	5.01850	1.14633	1.691	0.003	335	8	-3.9	-5.9		Venus	Moon
2010/02/15	00:55:52	4.63592	1.15115	5.962	0.003	335	10	-1.9	-6.3		Jupiter	Moon
2010/02/26	02:34:17	5.04006	1.28720	0.756	0.002	197	144	-0.9	-12.3		Mars	Moon
2010/03/13	12:27:48	3.53949	1.14681	30.917	0.003	336	-26	8.0	-8.2		Neptune	Moon
2010/03/14	20:45:01	5.04141	1.15595	5.960	0.003	335	-11	-1.9	-6.6		Jupiter	Moon
2010/03/25	11:39:05	4.30191	1.26616	0.958	0.002	197	117	-0.1	-11.6		Mars	Moon
2010/04/09	21:14:48	3.77040	1.14915	30.632	0.003	336	-52	7.9	-9.7		Neptune	Moon
2010/04/15	22:02:17	1.42580	1.19627	0.719	0.003	344	17	0.7	-7.4		Mercury	Moon
2010/04/16	11:08:10	3.99669	1.20411	1.528	0.003	347	23	-3.9	-8.1		Venus	Moon
2010/04/22	06:42:18	4.35310	1.25612	1.207	0.002	200	97	0.5	-11.1		Mars	Moon
2010/05/07	06:06:12	4.04444	1.15059	30.216	0.003	336	-78	7.9	-10.5		Neptune	Moon
2010/05/16	10:17:28	0.08384	1.24176	1.380	0.003	4	30	-3.8	-8.7	3626	Venus	Moon
2010/05/20	08:15:48	4.82937	1.25671	1.459	0.002	202	82	0.9	-10.7		Mars	Moon
2010/06/03	14:24:03	4.24627	1.15031	29.758	0.003	336	-104	7.9	-11.1		Neptune	Moon
2010/06/15	04:57:47	3.70835	1.27011	1.191	0.002	198	37	-3.9	-9.1		Venus	Moon
2010/06/30	21:31:00	4.30435	1.14853	29.351	0.003	336	-131	7.9	-11.7		Neptune	Moon
2010/07/12	22:10:40	3.91346	1.28541	1.236	0.002	199	16	-0.7	-7.3		Mercury	Moon
2010/07/28	03:14:37	4.24428	1.14636	29.082	0.003	336	-157	7.8	-12.3		Neptune	Moon
2010/08/11	23:58:43	2.15588	1.29212	0.815	0.002	204	27	0.5	-8.5		Mercury	Moon
2010/08/13	08:58:57	4.16902	1.27756	0.738	0.002	204	46	-4.2	-9.6		Venus	Moon
2010/08/24	07:59:21	4.17244	1.14507	29.009	0.003	337	176	7.8	-12.5		Neptune	Moon
2010/09/07	21:05:19	1.50981	1.29912	0.674	0.002	205	-8	1.9	-6.2		Mercury	Moon
2010/09/11	05:31:23	4.74132	1.27077	2.191	0.002	200	39	1.4	-9.3		Mars	Moon
2010/09/11	12:56:47	0.31887	1.26543	0.510	0.002	198	44	-4.6	-9.5	3367	Venus	Moon
2010/09/20	12:39:56	4.20045	1.14564	29.150	0.003	337	149	7.8	-12.2		Neptune	Moon
2010/10/09	17:18:06	3.19195	1.26343	0.326	0.002	15	28	-4.3	-8.5		Venus	Moon
2010/10/10	00:29:33	3.43322	1.25805	2.282	0.002	193	30	1.3	-8.8		Mars	Moon
2010/10/17	18:19:46	4.35961	1.14850	29.477	0.003	337	122	7.9	-11.5		Neptune	Moon
2010/11/05	08:25:07	0.16244	1.26988	0.278	0.002	199	-12	-2.9	-6.9	3188	Venus	Moon
2010/11/07	04:01:54	1.62894	1.24815	1.378	0.002	188	13	-0.6	-7.0		Mercury	Moon
2010/11/07	21:58:51	1.61481	1.23693	2.340	0.003	185	22	1.2	-8.1		Mars	Moon
2010/11/14	01:40:54	4.57259	1.15292	29.921	0.003	337	94	7.9	-10.9		Neptune	Moon
2010/12/06	21:41:19	0.52392	1.21056	2.370	0.003	355	15	1.2	-7.1	3237	Mars	Moon
2010/12/07	08:25:06	1.80240	1.20300	0.881	0.003	353	20	-0.1	-7.8		Mercury	Moon
2010/12/11	10:38:38	4.71919	1.15666	30.383	0.003	337	67	7.9	-10.2		Neptune	Moon

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione del pianeta

R1 = distanza in U.A. del pianeta dalla Terra

R2 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del pianeta

m2 = magnitudine della Luna

tm = se presente, il pianeta viene occultato massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation of the planet

R1 = distance in A.U. of the planet from the Earth

R2 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in °

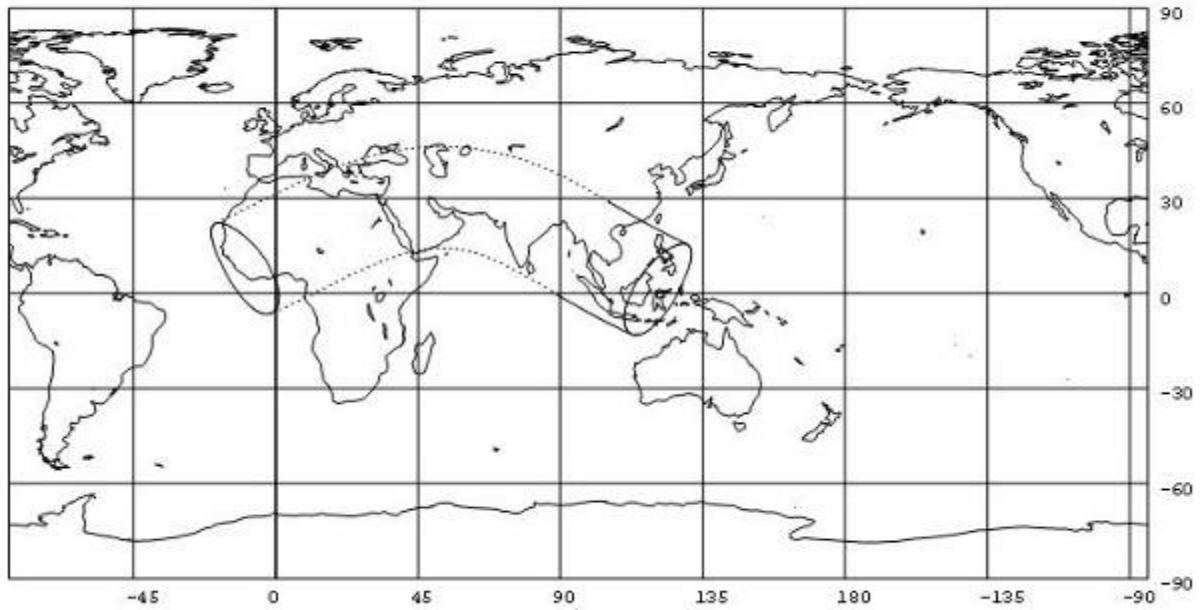
e = elongation, in degree

m1 = magnitude of the planet

m2 = magnitude of the Moon

tm = if present, the planet is occulted maximum for x seconds

# Occultation of Venus, Magnitude -3.9, on 2010 May 16



Occultation

UT of conjunction = 10h 16.8m

Date 2010 maggio 16 (domenica)

Luna: % illuminazione 7+, elongazione solare 30

Moon: % illumination 7+, solar elongation 30

Sparizione - Disappearance

Riapparizione - Reappearance

Luogo - Location	U.T.	Sun	Moon	CA	PA
	h m s	Alt	Alt Az	o	o
Agra India	10 23 41	39 69 269	83S	93	
Amritsar India	10 13 41	44 73 251	85N	81	
ASHKHABAD Iran	9 34 50	62 75 147	68N	64	
BAGHDAD Iraq	8 56 53	76 60 98	80N	75	
BAKU Azerbaijan	9 22 10	67 67 125	56N	52	
BANGALORE Ind	10 50 17	31 60 298	31S	144	
BANGKOK Thail	11 17 56	4 34 291	75S	100	
BOMBAY India	10 23 22	43 73 293	47S	128	
CALCUTTA India	10 51 16	23 53 282	82S	94	
COLOMBO SriLnk	11 18 21	21 49 301	5S	170	
Dehra Dun Ind	10 22 16	40 69 260	86N	82	
DELHI India	10 20 39	41 71 264	87S	89	
HANOI Vietnam	11 21 50	0 30 287	70N	66	
HO CHI MINH Vt	11 25 49	-5 25 293	77S	98	
HONG KONG Ch	11 37 18	-10 20 289	41N	37	
Hyderabad Ind	10 39 10	34 64 291	50S	126	
Indore India	10 23 13	41 71 281	65S	111	
ISLAMABAD Pak	10 9 22	46 75 239	79N	75	
Jaipur India	10 18 9	42 73 268	79S	96	
JAKARTA Indon	11 49 7	13 297	18S	157	
JAPAL India	10 40 32	33 63 292	49S	126	
JERUSALEM Isrl	8 39 24	72 49 88	76N	71	
Jodhpur India	10 11 22	46 77 267	74S	101	
KABUL Afgan	9 58 58	52 78 217	79N	74	
KANDLA India	10 7 50	50 80 283	60S	115	
KARACHI Pak	9 56 13	55 85 272	64S	111	
KATHMANDU Nepl	10 41 19	29 59 273	86N	81	
KUALA LUMPUR My	11 31 51	-4 25 296	44S	131	
KUNMING China	11 18 1	5 35 284	61N	57	
KUWAIT	9 0 8	79 65 93	83S	92	
Lahore Pakistn	10 12 8	45 74 249	86N	81	
Lhasa Tibet Cn	10 54 55	21 51 274	68N	64	
LUCKNOW India	10 31 10	35 65 272	85S	90	
MANILA Phil Is	11 36 36	11 293	62N	58	
MASHAD Iran	9 35 2	63 77 147	75N	71	
MT. ABU India	10 12 39	46 77 274	68S	107	
NAINI Tal Ind	10 26 12	38 67 265	88N	84	
Nanded India	10 33 7	37 67 289	54S	121	
NAZWA Muscat	9 30 18	70 80 77	54S	121	
NEW DELHI Ind	10 20 37	41 71 264	87S	89	
PADANG Indones	11 41 48	2 295	46S	129	
PENANG Sumatra	11 27 39	-1 28 295	49S	126	
PUNE India	10 26 53	41 71 293	47S	128	
RANGOON Burma	11 9 45	10 41 289	77S	98	
RIYADH SARabia	8 56 28	84 62 83	67S	108	
SALALAH Oman	9 36 44	72 76 55	25S	150	
SANAA Yemen	9 6 29	86 60 67	26S	150	

Luogo - Location	U.T.	Sun	Moon	CA	PA
	h m s	Alt	Alt Az	o	o
Agra India	11 52 21	20 50 277	-60N	296	
Amritsar India	11 39 13	26 56 269	-51N	305	
ASHKHABAD Iran	10 56 41	48 74 220	-48N	308	
BAGHDAD Iraq	10 29 50	65 78 133	-71N	285	
BAKU Azerbaijan	10 32 57	57 74 170	-42N	314	
BANGALORE Ind	12 2 39	14 44 292	-73S	248	
BANGKOK Thail	12 27 44	18 292	-63N	293	
BOMBAY India	11 52 14	23 53 286	-85S	261	
CALCUTTA India	12 10 27	6 36 285	-57N	299	
COLOMBO SriLnk	11 59 0	11 40 297	-49S	225	
Dehra Dun Ind	11 45 48	22 51 273	-51N	305	
DELHI India	11 48 29	22 51 275	-57N	299	
HANOI Vietnam	12 13 41	-11 19 290	-31N	326	
HO CHI MINH Vt	12 31 1	11 294	-62N	294	
HONG KONG Ch	12 1 7	15 291	-3N	353	
Hyderabad Ind	12 4 36	14 44 288	-90N	266	
Indore India	11 55 50	20 50 282	-77N	278	
ISLAMABAD Pak	11 31 50	29 58 263	-47N	309	
Jaipur India	11 49 55	22 52 277	-65N	291	
JAKARTA Indon	12 29 34	4 295	-60S	235	
JAPAL India	12 5 17	14 44 288	-90S	266	
JERUSALEM Isrl	10 6 15	76 67 101	-73N	282	
Jodhpur India	11 46 27	25 55 276	-71N	285	
KABUL Afgan	11 24 13	34 63 257	-49N	307	
KANDLA India	11 44 15	28 58 281	-85N	270	
KARACHI Pak	11 35 36	33 63 277	-84N	272	
KATHMANDU Nepl	11 57 58	12 42 280	-47N	309	
KUALA LUMPUR My	12 33 53	11 295	-86S	262	
KUNMING China	12 4 35	-4 25 287	-22N	334	
KUWAIT	10 40 45	62 84 148	-85N	271	
Lahore Pakistn	11 38 32	27 56 268	-52N	304	
Lhasa Tibet Cn	11 54 21	9 38 280	-30N	326	
LUCKNOW India	11 56 16	16 46 279	-57N	299	
MANILA Phil Is	12 16 54	3 295	-25N	331	
MASHAD Iran	11 2 52	46 73 231	-54N	303	
MT. ABU India	11 48 8	25 55 279	-76N	280	
NAINI Tal Ind	11 49 28	20 49 275	-51N	305	
Nanded India	12 1 38	17 47 286	-86N	270	
NAZWA Muscat	11 8 3	48 77 282	-77S	253	
NEW DELHI Ind	11 48 30	22 51 275	-57N	299	
PENANG Sumatra	12 33 16	14 294	-88N	268	
PUNE India	11 54 48	21 51 287	-86S	261	
RANGOON Burma	12 22 56	-6 24 290	-61N	295	
RIYADH SARabia	10 34 21	65 84 86	-78S	253	
SALALAH Oman	10 40 56	57 81 341	-45S	220	
SANAA Yemen	9 57 10	76 71 57	-32S	207	

SHIRAZ Iran	9	11	42	75	71	99	82S	94	SHIRAZ Iran	10	53	53	55	83	224	-82N	274
SINGAPORE	11	35	10	-8	22	296	42S	133	SINGAPORE	12	34	37		8	295	-84S	260
Srinigar India	10	14	13	44	72	243	76N	71	Srinigar India	11	32	42	28	57	264	-43N	313
TABRIZ Iran	9	9	42	71	63	111	63N	59	TABRIZ Iran	10	29	27	61	75	152	-52N	304
TASHKENT Kirgz	10	9	53	48	71	211	48N	44	TASHKENT Kirgz	11	1	54	38	64	237	-22N	335
TEHRAN Iran	9	14	56	71	69	115	76N	71	TEHRAN Iran	10	45	29	56	79	188	-61N	295
THIMBU Bhutan	10	51	31	23	53	276	79N	75	THIMBU Bhutan	12	0	11	8	38	281	-40N	316
Udaipur India	10	15	3	45	75	275	69S	106	Udaipur India	11	49	47	24	54	279	-75N	281
YUNNAN China	11	18	11	5	35	284	61N	57	YUNNAN China	12	4	37	-5	25	287	-22N	334

#### Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA
	h	m	s	Alt	Alt	Az		
Abastumani Geor	9	15	36	67	60	115	44N	40
Amman Jordan	8	40	40	73	50	88	76N	72
Ankara Turkey	8	58	29	67	50	99	42N	38
Ashkhabad Turkm	9	34	41	63	75	146	69N	64
Aswan Egypt	8	26	28	71	43	78	82S	94
Athens Greece	8	47	56	62	42	89	36N	32
Bagdad Iraq	8	56	53	76	60	98	80N	75
Baku Azerbaijan	9	22	9	67	67	125	56N	52
Beirut Lebanon	8	43	52	71	50	91	69N	65
Cairo Egypt	8	31	33	69	44	83	77N	72
Caminiti FurciSi	8	53	14	58	36	85	14N	10
Catania Italy	8	50	28	57	35	84	17N	13
Damascus Syria	8	44	3	72	51	91	71N	67
Iraklion Greece	8	39	7	63	41	86	50N	46
Istanbul Turkey	9	2	12	65	48	98	29N	25
Izmir Turkey	8	50	16	64	45	92	40N	36
Kuwait Kuwait	9	0	8	79	65	93	83S	92
Manama Bahrain	9	6	30	80	68	88	70S	105
Mecca Saudi Ara	8	39	49	81	52	77	63S	112
Riyadh Saudi Ar	8	56	28	84	62	83	67S	108
Shiraz Iran	9	11	42	75	71	99	82S	94
Tbilisi Georgia	9	21	8	66	62	121	43N	39
Tehran Iran	9	14	56	71	69	115	76N	71
Tel-Aviv Israel	8	39	22	72	49	88	74N	70
Thessaloniki Gr	9	2	23	62	44	93	17N	13
Tripoli Libya	8	31	15	53	29	78	39N	34
Valletta Malta	8	41	33	56	33	81	27N	23
Yerevan Armenia	9	12	41	69	61	114	52N	48
Zelenchukskaya	9	22	44	65	60	119	32N	28

#### Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA
	h	m	s	Alt	Alt	Az		

Vedere capitolo topocentrici successivo

#### Sparizione - Disappearance

Luogo - Location	U.T.			Sun Moon			CA	PA
	h	m	s	Alt	Alt	Az		
Ankara Turkey	8	58	29	67	50	99	42N	38
Athens Greece	8	47	56	62	42	89	36N	32
Cairo Egypt	8	31	33	69	44	83	77N	72
Istanbul Turkey	9	2	12	65	48	98	29N	25
Tehran Iran	9	14	56	71	69	115	76N	71
Tel-Aviv Israel	8	39	22	72	49	88	74N	70
Tripoli Libya	8	31	15	53	29	78	39N	34

#### Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA
	h	m	s	Alt	Alt	Az		
Abastumani Geor	10	13	14	63	69	139	-35N	321
Amman Jordan	10	8	2	75	68	103	-73N	283
Ankara Turkey	9	53	38	69	61	112	-39N	317
Ashkhabad Turkm	10	56	38	48	74	220	-48N	308
Aswan Egypt	9	55	26	84	63	82	-81S	257
Athens Greece	9	35	10	69	51	96	-37N	319
Bagdad Iraq	10	29	50	65	78	133	-71N	285
Baku Azerbaijan	10	32	50	57	74	169	-42N	314
Beirut Lebanon	10	6	38	74	67	107	-66N	290
Cairo Egypt	9	56	19	79	62	93	-77N	279
Caminiti FurciSi	9	12	25	61	40	87	-16N	340
Catania Italy	9	13	47	61	40	87	-20N	336
Damascus Syria	10	8	36	73	68	107	-68N	288
Iraklion Greece	9	41	39	72	53	95	-51N	305
Istanbul Turkey	9	41	9	68	55	106	-27N	329
Izmir Turkey	9	42	38	70	55	101	-40N	316
Kuwait Kuwait	10	40	45	62	84	148	-85N	271
Manama Bahrain	10	47	44	58	87	225	-85S	260
Mecca Saudi Ara	10	8	10	78	72	75	-66S	242
Riyadh Saudi Ar	10	34	21	65	84	86	-78S	253
Shiraz Iran	10	53	53	55	83	224	-82N	274
Tbilisi Georgia	10	15	56	61	70	146	-32N	324
Tehran Iran	10	45	29	56	79	188	-61N	295
Tel-Aviv Israel	10	5	9	76	67	102	-72N	284
Thessaloniki Gr	9	24	58	65	48	97	-17N	339
Tripoli Libya	9	18	46	63	39	83	-43N	313
Valletta Malta	9	17	14	62	40	86	-31N	325
Yerevan Armenia	10	20	21	63	72	144	-43N	313
Zelenchukskaya	10	3	37	63	66	134	-23N	333

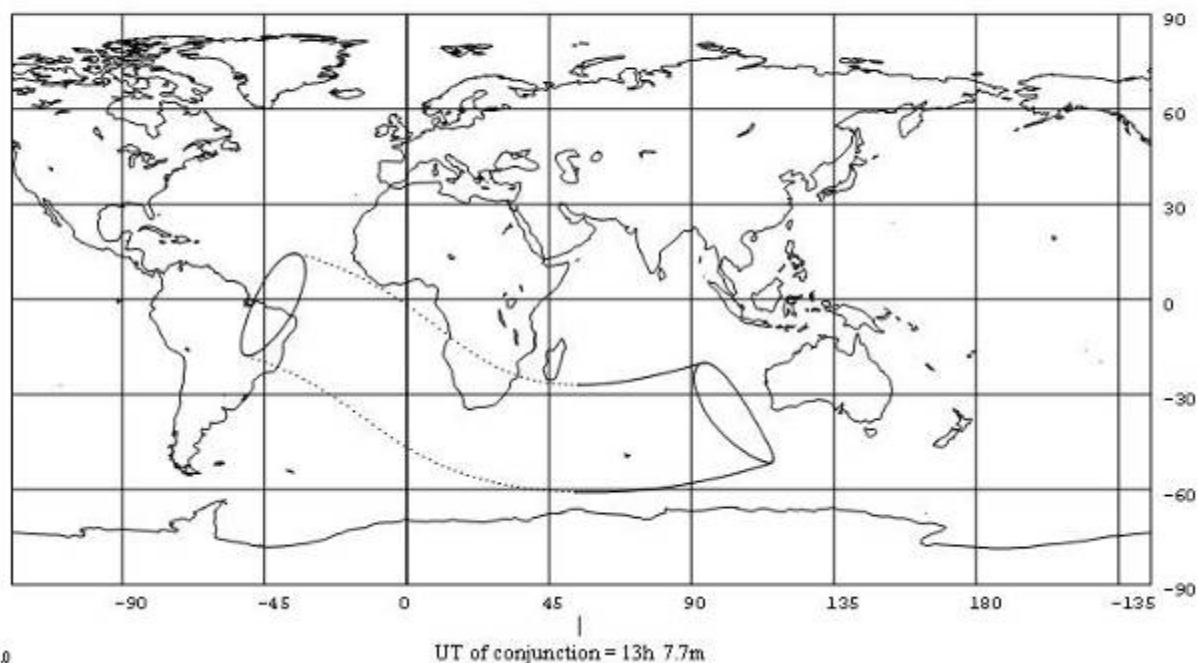
#### Riapparizione - Reappearance

Luogo - Location	U.T.			Sun Moon			CA	PA
	h	m	s	Alt	Alt	Az		

Sun alt : altezza del Sole sull'orizzonte, in gradi  
Moon alt : altezza della Luna sull'orizzonte, in gradi  
Moon az : azimut della Luna, in gradi  
CA : angolo di cuspid, angolo dell'evento lungo il lembo della Luna, misurato dalla cuspid più vicina;  
un valore negativo indica che il fenomeno avviene lungo il bordo luminoso  
PA : angolo di posizione, angolo dell'evento lungo il lembo della Luna, misurato da nord

Sun alt : height of the Sun above the horizon, in °  
Moon alt : height of the Moon above the horizon, in °  
Moon az : azimuth of the Moon, in °  
CA : angle of cuspid, angle of the event along the limb of the Moon, measured by the nearest cuspid;  
a negative value means that the phenomenon happens along the bright limb  
PA : angle of position , angle of the event along the limb of the Moon, measured from north

## Occultation of Venus, Magnitude -4.7, on 2010 Sep 11



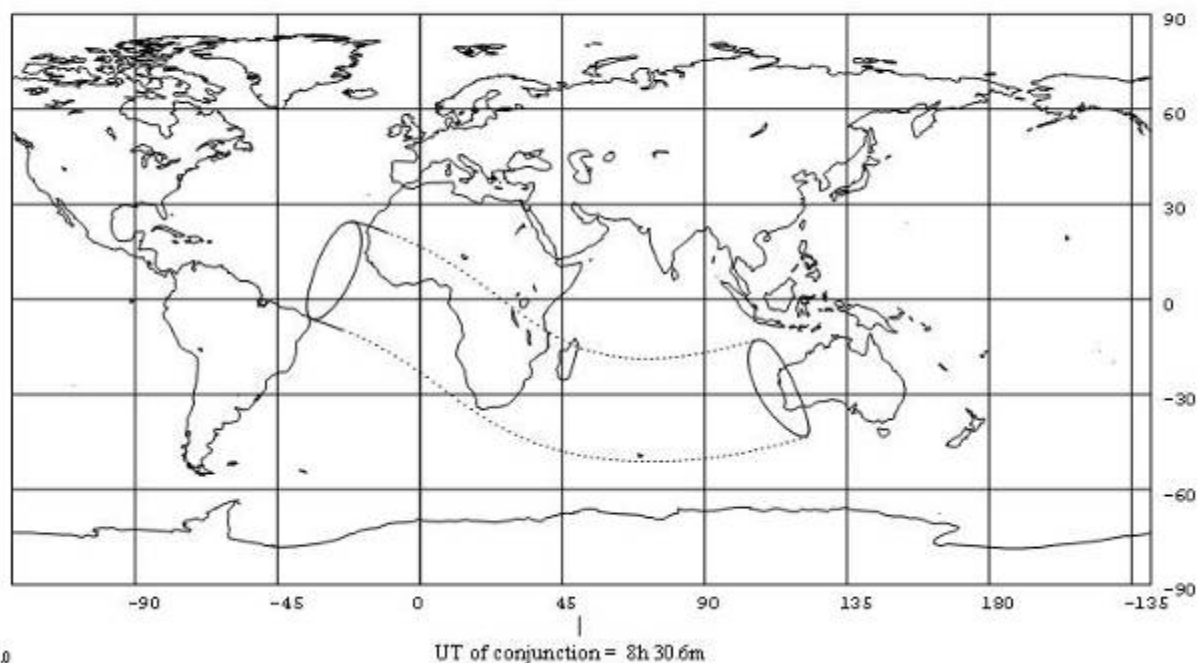
Date 2010 novembre 5 (venerdì)  
 Luna: % illuminazione 1-, elongazione solare 13 Moon: % illumination 1-, solar elongation 13

Sparizione - Disappearance						Riapparizione - Reappearance					
		U.T.		Sun	Moon	CA	PA			U.T.	
Location		h	m	s	Alt	Alt	o	Location		h	m
Bunbury		9	30	38	15	4	-56S			125	
Busselton		9	30	35	15	5	-55S			126	

Sun alt : altezza del Sole sull'orizzonte, in gradi  
 Moon alt : altezza della Luna sull'orizzonte, in gradi  
 Moon az : azimuth della Luna, in gradi  
 CA : angolo di cuspid, angolo dell'evento lungo il lembo della Luna, misurato dalla cuspid più vicina;  
 un valore negativo indica che il fenomeno avviene lungo il bordo luminoso  
 PA : angolo di posizione, angolo dell'evento lungo il lembo della Luna, misurato da nord

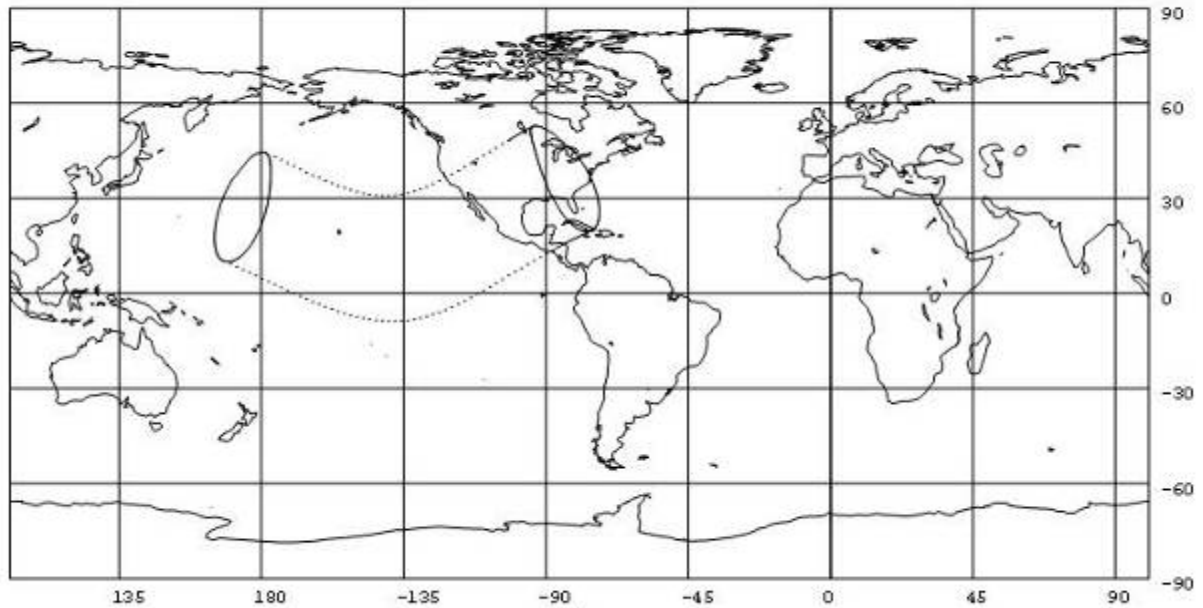
Sun alt : height of the Sun above the horizon, in °  
 Moon alt : height of the Moon above the horizon, in °  
 Moon az : azimuth of the Moon, in °  
 CA : angle of cuspid, angle of the event along the limb of the Moon, measured by the nearest cuspid;  
 a negative value means that the phenomenon happens along the bright limb  
 PA : angle of position , angle of the event along the limb of the Moon, measured from north

# Occultation of Venus, Magnitude -4.2, on 2010 Nov 5



© (8)

# Occultation of Mars, Magnitude 1.3, on 2010 Dec 6



Occult 4050

UT of conjunction = 21h 46.8m

Date 2010 dicembre 6 (lunedì)

Luna: % illuminazione 2+, elongazione solare 14

Moon: % illumination 2+, solar elongation 14

## Sparizione - Disappearance

Location	U.T. h m s	Sun Alt	Moon Alt	CA o	PA o
Abilene TX	22 24 20	12 20	51N	55	
Acapulco MX	22 29 2	20 31	85S	99	
Alamogordo NM	22 17 56	17 24	40N	44	
Albuquerque NM	22 18 50	15 22	32N	37	
Amarillo TX	22 23 7	12 19	40N	45	
AnnArbor MI	22 33 13	-6 3	48N	53	
Asheville NC	22 37 7	-4 6	68N	72	
Ashland KY	22 35 20	-5 4	60N	65	
Atlanta GA	22 37 11	-2 8	71N	75	
Augusta GA	22 39 5	-4 6	75N	79	
Austin TX	22 26 29	11 20	60N	64	
Bakersfield CA	22 10 5	23 28	8N	12	
Baton Rouge LA	22 33 26	5 15	70N	74	
Battle Creek MI	22 32 46	-5 4	46N	51	
Beaumont TX	22 30 34	8 18	66N	70	
Biloxi MS	22 35 41	3 13	73N	77	
Birmingham AL	22 35 35	0 10	68N	72	
Bismarck ND	22 33 57	2 9	4N	8	
Bloomington IL	22 31 46	-1 7	46N	50	
BowlingGreen KY	22 34 6	-2 8	59N	63	
Brownsville TX	22 27 45	13 23	72N	76	
Cedar Rapids IA	22 30 35	0 8	38N	42	
Champaign IL	22 32 10	-2 7	48N	52	
Charleston SC	22 41 3	-6 5	80N	84	
Charleston WV	22 35 52	-6 4	62N	66	
Charlotte NC	22 38 21	-6 4	72N	76	
Chattanooga TN	22 35 47	-2 8	66N	70	
Cheyenne WY	22 26 2	9 16	17N	22	
Chicago IL	22 32 2	-3 6	44N	48	
Chihuahua MX	22 15 32	20 28	51N	55	
Cincinnati OH	22 34 10	-4 5	56N	60	
CiudadJuarez MX	22 16 32	18 25	42N	47	
ColoradoSpgs CO	22 23 28	11 18	24N	29	
Columbia MO	22 30 19	2 11	45N	49	
Columbia SC	22 39 14	-5 5	75N	79	
Columbus GA	22 37 39	-1 9	74N	78	
Columbus OH	22 34 24	-5 4	56N	60	
Crps Christi TX	22 27 19	12 22	67N	71	
Dallas TX	22 27 16	9 18	55N	59	
Davenport IA	22 31 1	0 8	41N	45	
Dayton OH	22 34 1	-4 5	55N	59	
DaytonaBeach FL	22 43 55	-4 7	90N	93	
Decatur IL	22 31 54	-1 8	47N	52	
Denver CO	22 24 19	10 17	21N	26	
Des Moines IA	22 29 49	2 9	36N	40	
Dodge City KS	22 25 28	9 16	36N	41	
Dubuque IA	22 30 56	-1 7	38N	42	

## Riapparizione - Reappearance

Location	U.T. h m s	Sun Alt	Moon Alt	CA o	PA o
Abilene TX	23 37 5	-1 9	-88S	272	
Acapulco MX	23 38 56	5 18	-41S	224	
Alamogordo NM	23 28 27	5 14	-80N	283	
Albuquerque NM	23 23 28	5 14	-73N	291	
Amarillo TX	23 30 44	0 10	-80N	283	
Austin TX	23 41 0	-3 8	-79S	262	
Bakersfield CA	22 50 3	18 24	-44N	320	
Beaumont TX	23 43 25	-6 5	-73S	256	
Brownsville TX	23 43 21	-2 10	-66S	249	
Chihuahua MX	23 33 51	6 16	-87S	271	
CiudadJuarez MX	23 29 26	5 15	-83N	281	
Crps Christi TX	23 42 46	-2 9	-71S	254	
Dallas TX	23 39 23	-4 6	-85S	268	
Dodge City KS	23 28 39	-2 7	-76N	288	
El Paso TX	23 29 21	5 15	-83N	281	
Enid OK	23 33 30	-4 6	-83N	281	
Flagstaff AZ	23 12 49	10 18	-63N	301	
Fort Worth TX	23 38 58	-4 7	-85S	269	
Fresno CA	22 40 2	19 24	-34N	331	
Gallup NM	23 18 34	7 15	-67N	297	
Galveston TX	23 43 29	-5 6	-72S	255	
GrndJunction CO	23 10 0	6 14	-55N	309	
Guadalajara MX	23 39 49	6 18	-59S	242	
GuatemalaCityGT	23 30 49	0 13	-8S	191	
Hermosillo MX	23 25 14	11 20	-83N	281	
Hilo HI	21 25 37	46 39	-69N	295	
Honolulu HI	21 18 22	44 35	-67N	297	
Houston TX	23 42 56	-5 6	-74S	257	
Kingsville TX	23 42 38	-2 9	-71S	254	
La Paz MX	23 31 33	12 22	-81S	265	
Laredo TX	23 41 31	0 11	-73S	257	
Las Cruces NM	23 28 7	6 15	-81N	283	
Las Vegas NV	23 0 33	13 21	-51N	313	
Lihue HI	21 14 56	42 33	-66N	298	
Long Beach CA	22 58 14	17 24	-54N	310	
Los Angeles CA	22 57 14	17 24	-52N	312	
Lubbock TX	23 33 11	0 10	-85N	278	
Marshall TX	23 41 20	-6 4	-80S	264	
Mexico City MX	23 41 21	3 15	-48S	231	
Ogden UT	22 50 41	10 16	-34N	330	
OklahomaCity OK	23 35 19	-4 6	-86N	277	
Pasadena CA	22 57 13	17 24	-52N	312	
Phoenix AZ	23 15 43	11 19	-68N	296	
Port Arthur TX	23 43 37	-6 5	-72S	255	
Provo UT	22 57 1	9 16	-42N	323	
Salina KS	23 29 36	-4 5	-76N	288	
SaltLakeCity UT	22 53 40	10 16	-38N	326	



Duluth MN	22	31	37	-2	5	23N	27	San Angelo TX	23	37	29	-1	10	-86S	270
Durham NC	22	38	47	-8	3	72N	76	San Antonio TX	23	41	2	-2	9	-77S	261
Eau Claire WI	22	31	4	-2	6	30N	34	San Bernrdno CA	23	0	10	16	23	-54N	310
El Paso TX	22	16	35	18	25	42N	46	San Diego CA	23	4	17	16	24	-60N	304
Enid OK	22	26	33	8	16	43N	48	SantaBarbara CA	22	50	58	19	25	-47N	317
Evansville IN	22	33	5	-1	8	55N	59	Texarkana TX	23	40	41	-7	4	-82S	266
Fargo ND	22	32	12	0	7	14N	18	Tucson AZ	23	20	34	10	19	-74N	290
Fayetteville NC	22	39	35	-7	3	75N	79	Tulsa OK	23	35	46	-6	4	-87N	277
Flagstaff AZ	22	14	40	19	25	23N	28	Victoria TX	23	42	32	-3	8	-73S	257
Fort Wayne IN	22	33	9	-4	5	50N	54	Waco TX	23	40	19	-4	7	-82S	265
Fort Worth TX	22	26	45	9	18	54N	58	Wichita KS	23	31	58	-4	5	-80N	284
Fresno CA	22	15	54	22	26	-3N	2	WichitaFalls TX	23	36	29	-3	7	-89N	274
FtSmith AR	22	29	9	6	14	51N	56	Yuma AZ	23	11	13	14	22	-65N	299
Gadsden AL	22	35	53	-1	9	68N	72								
Gainesville FL	22	42	19	-3	8	86N	90								
Gallup NM	22	17	28	17	23	28N	32								
Galveston TX	22	30	3	9	19	67N	71								
Gary IN	22	32	13	-3	6	45N	50								
Grand Rapids MI	22	32	26	-5	4	44N	48								
Green Bay WI	22	31	37	-4	4	36N	41								
Greensboro NC	22	38	17	-7	3	71N	75								
Greenville SC	22	37	44	-4	6	71N	75								
GrndJunction CO	22	22	11	13	19	16N	21								
Guadalajara MX	22	19	36	22	32	77N	81								
GuatemalaCityGT	22	55	28	7	20	51S	132								
Gulfport MS	22	35	29	3	13	73N	77								
Hamilton OH	22	34	0	-4	5	55N	59								
Havana Cuba	22	51	6	-2	10	71S	112								
Hermosillo MX	22	8	42	24	30	42N	46								
Hilo HI	19	59	58	37	25	65N	69								
Honolulu HI	19	56	55	34	22	64N	68								
Houston TX	22	29	16	9	19	65N	69								
Huntington WV	22	35	28	-5	4	61N	65								
Huntsville AL	22	35	6	-1	9	65N	69								
Indianapolis IN	22	33	10	-3	6	52N	56								
Iowa City IA	22	30	38	0	8	39N	43								
Jackson MI	22	33	2	-5	3	48N	52								
Jackson MS	22	33	30	3	13	66N	70								
Jacksonville FL	22	42	10	-4	7	85N	89								
Joplin MO	22	29	3	5	13	47N	51								
Kalamazoo MI	22	32	39	-4	4	46N	50								
Kansas City KS	22	29	4	4	12	41N	45								
Kansas City MO	22	29	5	4	12	41N	46								
Kenosha WI	22	31	52	-3	5	42N	46								
Key West FL	22	49	25	-3	9	75S	108								
Kingsville TX	22	26	49	13	22	67N	71								
Knoxville TN	22	36	6	-3	6	65N	69								
La Paz MX	22	6	22	27	35	57N	61								
Lafayette IN	22	32	40	-3	6	49N	53								
Lansing MI	22	32	50	-5	3	46N	51								
Laredo TX	22	24	35	14	24	65N	69								
Las Cruces NM	22	16	41	18	25	40N	45								
Las Vegas NV	22	13	59	20	25	13N	18								
Lexington KY	22	34	40	-4	6	59N	63								
Lihue HI	19	55	15	32	20	64N	68								
Lima OH	22	33	39	-5	4	52N	56								
Lincoln NE	22	28	28	4	12	33N	37								
Little Rock AR	22	30	55	4	13	56N	61								
Long Beach CA	22	6	18	24	29	16N	21								
Los Angeles CA	22	6	52	24	29	15N	19								
Louisville KY	22	33	55	-3	7	56N	61								
Lubbock TX	22	22	27	13	21	44N	49								
Macon GA	22	38	25	-3	8	75N	79								
Madison WI	22	31	20	-2	6	38N	43								
Marshall TX	22	29	36	7	16	59N	63								
Memphis TN	22	32	28	2	11	59N	63								
Mexico City MX	22	28	34	18	29	89N	92								
Miami FL	22	49	16	-5	7	77S	107								
Milwaukee WI	22	31	48	-3	5	40N	45								
Minneapolis MN	22	30	50	-1	7	26N	31								
Mobile AL	22	36	17	2	12	74N	78								
Moline IL	22	31	2	-1	8	41N	45								
Monterey MX	22	23	41	16	26	68N	72								
Montgomery AL	22	36	41	0	10	72N	76								
Muncie IN	22	33	21	-4	5	52N	56								
Nashville TN	22	34	17	-1	8	61N	65								
Natchez MS	22	32	44	5	15	66N	70								
New Orleans LA	22	34	48	4	14	73N	77								
Ogden UT	22	28	27	13	18	-3N	2								
OklahomaCity OK	22	26	45	8	16	46N	51								
Omaha NE	22	28	55	3	11	33N	37								
Orlando FL	22	44	22	-4	7	89S	95								
Paducah KY	22	32	46	0	9	55N	60								
Pasadena CA	22	7	13	24	29	15N	19								
Pensacola FL	22	37	16	1	12	76N	80								
Peoria IL	22	31	27	-1	8	44N	49								
Phoenix AZ	22	11	48	21	27	28N	33								
Pierre SD	22	30	2	4	11	15N	20								
Pine City MN	22	31	12	-1	6	24N	29								
Port Arthur TX	22	30	49	8	18	67N	71								
Provo UT	22	24	30	14	19	4N	9								
Pueblo CO	22	23	1	11	18	27N	31								
Racine WI	22	31	52	-3	5	41N	46								
Raleigh NC	22	39	6	-8	2	73N	77								
RapidCity SD	22	30	11	6	12	9N	14								
Roanoke VA	22	37	20	-7	3	67N	72								
Rochester MN	22	30	41	-1	7	31N	35								

Rockford IL	22	31	30	-2	6	41N	45
Salina KS	22	27	20	6	14	37N	41
SaltLakeCity UT	22	26	20	13	19	0N	5
San Angelo TX	22	23	27	13	21	52N	57
San Antonio TX	22	25	42	12	22	61N	65
San Bernrdno CA	22	7	52	24	28	16N	21
San Diego CA	22	5	5	25	30	22N	26
Santa Fe NM	22	19	57	14	21	32N	36
SantaBarbara CA	22	6	50	25	29	10N	15
Sarasota FL	22	44	42	-3	9	87S	97
Savannah GA	22	40	54	-5	6	81N	85
Sheboygan WI	22	31	46	-4	5	39N	43
Sheridan WY	22	36	9	7	13	-8N	357
Shreveport LA	22	30	50	6	15	61N	65
Sioux City IA	22	29	13	3	10	28N	33
Sioux Falls SD	22	29	40	2	10	25N	29
South Bend IN	22	32	35	-4	5	46N	51
Spartanburg SC	22	37	56	-5	5	71N	75
Springfield IL	22	31	34	0	8	47N	51
Springfield MO	22	29	51	4	12	48N	52
Springfield OH	22	34	6	-5	4	55N	59
St Joseph MO	22	29	2	4	12	39N	43
St Louis MO	22	31	30	1	9	49N	53
St Paul MN	22	30	50	-1	7	27N	31
StCloud MN	22	31	1	0	7	23N	28
StPetersburg FL	22	44	6	-2	9	88S	95
Superior WI	22	31	35	-2	5	23N	28
Tallahassee FL	22	39	52	-1	9	81N	84
Tampa FL	22	44	4	-3	9	89S	95
TerreHaute IN	22	32	42	-2	7	51N	55
Texarkana TX	22	29	43	6	15	57N	61
Toledo OH	22	33	30	-6	3	50N	55
Topeka KS	22	28	30	5	13	39N	44
Tucson AZ	22	11	36	21	27	34N	38
Tulsa OK	22	27	58	6	15	47N	51
Urbana IL	22	32	11	-2	7	48N	52
Victoria TX	22	27	37	11	21	65N	69
W Palm Beach FL	22	48	1	-5	7	80S	103
Waco TX	22	26	59	10	19	57N	62
WashingtonCH OH	22	34	26	-5	4	56N	61
Waterloo IA	22	30	24	0	8	35N	40
Wichita KS	22	27	15	7	15	40N	45
WichitaFalls TX	22	25	44	10	18	49N	53
Wilmington NC	22	40	54	-8	2	79N	83
WinstonSalem NC	22	38	2	-6	4	70N	74
Wytheville VA	22	37	0	-6	4	67N	71
Yuma AZ	22	7	57	23	29	26N	31
Zanesville OH	22	34	48	-6	3	57N	61

Sun alt : altezza del Sole sull'orizzonte, in gradi

Moon alt : altezza della Luna sull'orizzonte, in gradi

Moon az : azimut della Luna, in gradi

CA : angolo di cuspidi, angolo dell'evento lungo il lembo della Luna, misurato dalla cuspidi più vicina;  
un valore negativo indica che il fenomeno avviene lungo il bordo luminoso

PA : angolo di posizione, angolo dell'evento lungo il lembo della Luna, misurato da nord

Sun alt : height of the Sun above the horizon, in °

Moon alt : height of the Moon above the horizon, in °

Moon az : azimuth of the Moon, in °

CA : angle of cuspidi, angle of the event along the limb of the Moon, measured by the nearest cuspidi;  
a negative value means that the phenomenon happens along the bright limb

PA : angle of position , angle of the event along the limb of the Moon, measured from north

# EVENTI TOPOCENTRICI <5° LUNA-PIANETI

## TOPOCENTRIC EVENT <5° MOON-PLANETS

42°N - 12°E

Date	UT	Dm	Alt.	r1	r2	p	e	m1	m2	tm(s)		
2010/01/15	08:07:04	0.54144	10.84	1.711	0.003	346	1	-3.9	-0.9		Venus	Moon
2010/01/18	05:47:08	3.51473	-28.29	5.806	0.003	341	32	-2.0	-8.7		Jupiter	Moon
2010/02/12	03:32:45	1.48061	-20.06	1.230	0.003	349	-21	-0.1	-7.8		Mercury	Moon
2010/02/14	03:53:41	2.69518	-27.32	31.011	0.003	342	1	8.0	-3.1		Neptune	Moon
2010/02/16	12:14:59	4.91402	43.43	20.968	0.003	322	27	5.9	-8.3		Uranus	Moon
2010/03/13	12:44:42	3.16506	22.00	30.916	0.003	326	-26	8.0	-8.3		Neptune	Moon
2010/03/25	11:12:02	4.86045	-6.33	0.958	0.002	191	117	-0.1	-11.6		Mars	Moon
2010/04/12	07:28:23	4.88002	36.28	21.006	0.003	325	-24	5.9	-8.2		Uranus	Moon
2010/04/15	22:58:43	0.71556	-26.99	0.718	0.003	350	17	0.7	-7.4		Mercury	Moon
2010/04/16	08:52:03	3.48469	35.11	1.529	0.003	336	23	-3.9	-8.1		Venus	Moon
2010/04/22	06:48:49	5.09715	-26.97	1.207	0.002	194	97	0.5	-11.1		Mars	Moon
2010/05/07	05:04:58	3.37771	32.95	30.217	0.003	326	-78	7.9	-10.5		Neptune	Moon
2010/05/16	09:05:00	0.33622	35.24	1.381	0.002	175	30	-3.8	-8.7	3626	Venus	Moon
2010/06/11	00:26:17	4.34057	-20.27	1.113	0.003	351	-19	-0.4	-7.6		Mercury	Moon
2010/06/15	04:36:17	4.35474	-16.29	1.191	0.002	191	37	-3.9	-9.2		Venus	Moon
2010/06/30	21:01:50	4.48542	-5.02	29.351	0.003	339	-130	7.9	-11.7		Neptune	Moon
2010/07/12	22:40:06	4.81195	-22.67	1.236	0.002	196	16	-0.7	-7.3		Mercury	Moon
2010/07/28	02:54:29	3.83363	28.77	29.082	0.003	325	-157	7.8	-12.3		Neptune	Moon
2010/07/30	20:19:41	5.06715	-5.09	19.464	0.003	335	-127	5.8	-11.6		Uranus	Moon
2010/08/13	07:15:36	4.46507	-12.53	0.739	0.002	204	46	-4.2	-9.6		Venus	Moon
2010/09/11	11:28:53	0.97600	23.50	0.510	0.002	209	44	-4.6	-9.5		Venus	Moon
2010/10/09	17:45:56	2.36802	-6.17	0.326	0.002	9	28	-4.3	-8.5		Venus	Moon
2010/10/17	17:17:13	3.61852	27.33	29.477	0.003	330	122	7.9	-11.5		Neptune	Moon
2010/11/05	07:00:01	0.72398	17.47	0.277	0.002	208	-12	-2.9	-6.9		Venus	Moon
2010/12/07	07:32:54	1.08935	-6.48	0.882	0.003	1	20	-0.1	-7.8		Mercury	Moon
2010/12/11	10:10:28	3.90078	-5.18	30.383	0.003	340	67	7.9	-10.2		Neptune	Moon

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Alt = altezza in gradi sull'orizzonte dell'evento nel momento centrale

R1 = distanza in U.A. del pianeta dalla Terra

R2 = distanza in U.A. della Luna dalla Terra

p = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del pianeta

m2 = magnitudine della Luna

tm = se presente, il pianeta viene occultato massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Alt = height in ° on the horizon of the event in the central moment

R1 = distance in A.U. of the planet from the Earth

R2 = distance in A.U. of the Moon from the Earth

p = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the planet

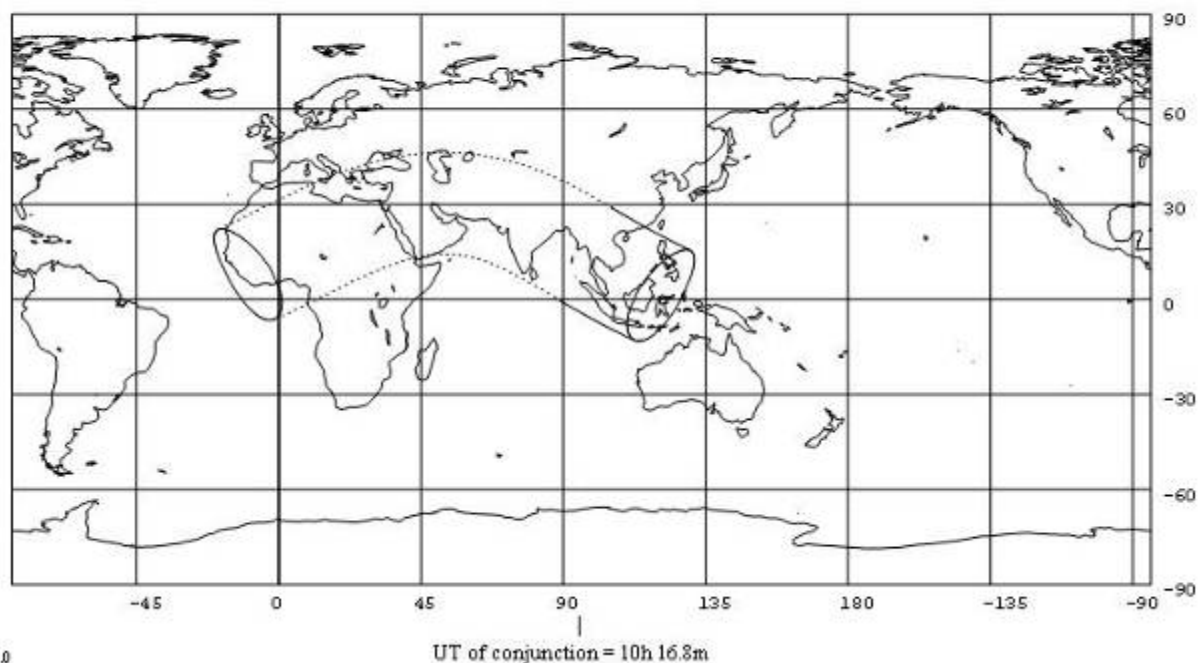
m2 = magnitude of the Moon

tm = if present, the planet is occulted maximum for x seconds

NB : i presenti dati, con una variazione di pochi centesimi di grado del valore Dm e di pochi minuti del valore U.T., sono altresì validi per il resto di Italia

Questo anno avviene solamente una occultazione radente visibile dal sud Italia

# Occultation of Venus, Magnitude -3.9, on 2010 May 16



Occult4.0.5.0

Date 2010 maggio 16 (domenica)

Luna: % illuminazione 7+, elongazione solare 30

Moon: % illumination 7+, solar elongation 30

Sparizione - Disappearance

Riapparizione - Reappearance

Luogo - Location	U.T.	Sun	Moon	CA	PA
	h m s	Alt	Alt	Az	o o
AGRIGENTO	8 51 37	56 34	83	13N	9
CALTANISSETTA	8 52 8	57 35	83	13N	9
CATANIA	8 50 28	57 35	84	17N	13
CATANZARO	8 59 31	59 38	87	7N	3
ENNA	8 52 12	57 35	84	13N	9
MESSINA	8 54 55	58 36	85	12N	8
RAGUSA	8 47 25	57 34	83	20N	16
REGGIO CALABRIA	8 53 59	58 36	85	13N	9
SIRACUSA	8 47 25	57 35	83	21N	17

Luogo - Location	U.T.	Sun	Moon	CA	PA
	h m s	Alt	Alt	Az	o o
AGRIGENTO	9 9 28	59 38	85	-16N	340
CALTANISSETTA	9 10 7	60 38	86	-16N	340
CATANIA	9 13 47	61 40	87	-20N	336
CATANZARO	9 10 30	61 40	89	-10N	346
ENNA	9 10 38	60 39	86	-16N	340
MESSINA	9 11 48	61 40	88	-15N	342
RAGUSA	9 14 48	61 40	87	-23N	333
REGGIO CALABRIA	9 12 32	61 40	88	-16N	340
SIRACUSA	9 16 1	62 40	87	-24N	332

Sun alt : altezza del Sole sull'orizzonte, in gradi

Moon alt : altezza della Luna sull'orizzonte, in gradi

Moon az : azimuth della Luna, in gradi

CA : angolo di cuspid, angolo dell'evento lungo il lembo della Luna, misurato dalla cuspid più vicina;  
un valore negativo indica che il fenomeno avviene lungo il bordo luminoso

PA : angolo di posizione, angolo dell'evento lungo il lembo della Luna, misurato da nord

Sun alt : height of the Sun above the horizon, in °

Moon alt : height of the Moon above the horizon, in °

Moon az : azimuth of the Moon, in °

CA : angle of cuspid, angle of the event along the limb of the Moon, measured by the nearest cuspid;  
a negative value means that the phenomenon happens along the bright limb

PA : angle of position , angle of the event along the limb of the Moon, measured from north

© (8)

# CONGIUNZIONI MULTIPLE PIANETI-LUNA

(eventi con 2 o più pianeti e la Luna entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS-MOON

(events with 2 or more planets and the Moon within 5°)

### Geocentriche - Geocentric

Date	TT	Dmed	Dmax	emin	m2d	mmax			
2010/01/18	00:38:12	4.643	4.902	27	-2.0	8.0	Jupiter	Neptune	Moon
2010/02/14	22:56:24	4.245	5.169	8	-3.9	-1.9	Venus	Jupiter	Moon

### Topocentriche - Topocentric 42°N - 12°E

Date	UT	Dmed	Dmax	emin	m2d	mmax			
2010/01/18	01:43:32	4.414	4.885	27	-2.0	8.0	Jupiter	Neptune	Moon

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest body

mmax = least magnitude

© (6)

Per le congiunzioni multiple stellari consultare più avanti

**CONGIUNZIONI MULTIPLE MISTE**  
**CERCHI MINIMI GEOCENTRICI PIANETI-LUNA**  
(eventi con 2 pianeti e la Luna entro 5°)  
**MULTIPLE CONJUNCTIONS**  
**LEAST GEOCENTRIC GROUPING PLANETS-MOON**  
(events with 2 planets and the Moon within 5°)

DATE	TIMES	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT
------	-------	--------	-----	-----	-----	-------	-----	------	------	------	------

Questo anno non avvengono fenomeni - No phenomena this year

**CONGIUNZIONI MULTIPLE MISTE**  
**CERCHI MINIMI TOPOCENTRICI PIANETI-LUNA**  
(eventi con 2 pianeti e la Luna entro 5°)  
**MULTIPLE CONJUNCTIONS**  
**LEAST TOPOCENTRIC GROUPING PLANETS-MOON**  
(events with 2 planets and the Moon within 5°)  
42°N - 12°E

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
14	02 2010 22	VENUS JUPITER MOON	2.2	4.6	4.7	4.8	9	-3.9	-2.0	-4.9	-5.3	-48	310	-40	311
14	02 2010 23	VENUS JUPITER MOON	2.2	4.7	4.4	4.7	10	-3.9	-2.0	-5.0	-5.4	-55	332	-46	329
15	02 2010 00	VENUS JUPITER MOON	2.1	4.7	4.2	4.8	10	-3.9	-2.0	-5.0	-5.4	-57	0	-49	350
15	02 2010 01	VENUS JUPITER MOON	2.1	4.9	4.0	4.9	10	-3.9	-2.0	-5.0	-5.4	-55	27	-48	13

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

Date in the format day/month/year

Dxy = distance between the body x and y, in °

GROUP = least group, in degree

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

**CONGIUNZIONI MULTIPLE MISTE**  
**QUARTETTI GEOCENTRICI PIANETI-LUNA**  
(eventi con 3 pianeti e la Luna entro 5°)  
**MULTIPLE CONJUNCTIONS**  
**GEOCENTRIC QUARTETS PLANETS-MOON**  
(events with 3 planets and the Moon within 5°)

DATE	TIMES	BODIES	D12	D13	D14	D23	D24	D34	DQM	MAX	EL.	MAG1	MAG2	MAG3	MAG4	MAGT
------	-------	--------	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------

Questo anno non avvengono fenomeni - No phenomena this year

**CONGIUNZIONI MULTIPLE MISTE**  
**QUARTETTI TOPOCENTRICI PIANETI-LUNA**  
(eventi con 3 pianeti e la Luna entro 5°)  
**MULTIPLE CONJUNCTIONS**  
**TOPOCENTRIC QUARTETS PLANETS-MOON**  
(events with 3 planets and the Moon within 5°)  
42°N - 12°E

DATE	TIMES	BODIES	D12	D13	D14	D23	D24	D34	DQM	MAX	EL.	MAG1	MAG2	MAG3	MAG4	MAGT	ALT	AZ
------	-------	--------	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	------	------	------	------	-----	----

Questo anno non avvengono fenomeni - No phenomena this year

Date, Time = data ed ora  
Dxy = distanza tra il corpo x e quello y, in gradi  
Group = cerchio minimo comprendente tutto il gruppo, in gradi  
EL = elongazione dal Sole, in gradi  
MAGx = magnitudine del corpo x  
MAGT = magnitudine totale del gruppo  
ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi  
AZ = azimut del baricentro geometrico del gruppo, in gradi da nord  
ALT.S. = altezza sull'orizzonte del Sole, in gradi  
AZ.S. = azimut del Sole, in gradi da nord  
ALT.S. = height on the horizon of the Sun, in °  
AZ.S. = azimuth of the Sun, in ° from north  
Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna  
Ore in T.U.

Date in the format day/month/year  
Dxy = distance between the body x and y, in °  
GROUP = least group, in degree  
EL = elongation from the Sun, in °  
MAGx = magnitude of body x  
MAGT = total magnitude  
ALT = height on the horizon of the baricenter of the group, in °  
AZ = azimuth of the baricenter of the group, in ° from north  
Times in U.T.



# PIANETI-LUNA IN LINEA RETTA - GEOCENTRICI PLANETS-MOON IN STRAIGHT LINE - GEOCENTRIC

DATE                      TIMES                      BODIES                      C

Questo anno non avvengono fenomeni - No phenomena this year

# PIANETI-LUNA IN LINEA RETTA - TOPOCENTRICI PLANETS-MOON IN STRAIGHT LINE-TOPOCENTRIC 42°N - 12°E

DATE                      TIMES                      BODIES                      C                      ALT                      AZ                      ALT.S.                      AZ.S

Questo anno non avvengono fenomeni - No phenomena this year

Quanto più il parametro C è prossimo a zero tanto più i corpi sono allineati

Date, Time = data ed ora

Bodies = corpi

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Ore in T.U.

How much anymore the parameter C is next to zero so much the bodies are lined up

Date in the format day/month/year

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# PIANETI-LUNA IN LINEA RETTA (4) - GEOCENTRICI PLANETS-MOON IN STRAIGHT LINE (4) - GEOCENTRIC

DATE	TIMES	BODIES	C	ALT	AZ	ALT.S.	AZ.S
------	-------	--------	---	-----	----	--------	------

Questo anno non avvengono fenomeni - No phenomena this year

# PIANETI-LUNA IN LINEA RETTA (4) - TOPOCENTRICI PLANETS-MOON IN STRAIGHT LINE (4) - TOPOCENTRIC 42°N - 12°E

DATE	TIMES	BODIES	C	ALT	AZ	ALT.S.	AZ.S
------	-------	--------	---	-----	----	--------	------

Questo anno non avvengono fenomeni - No phenomena this year

Quanto più il parametro C è prossimo a zero tanto più i corpi sono allineati

Date, Time = data ed ora

Bodies = corpi

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

How much anymore the parameter C is next to zero so much the bodies are lined up

Date in the format day/month/year

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# GEOMETRIE SPAZIALI LUNARI-TRIANGOLI EQUILATERI LUNAR SPATIAL GEOMETRIES-EQUILATERAL TRIANGLES

Geocentrici - geocentric

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
------	------	--------	-----	-----	-----	-------	-----	------	------	------	------	-----	----	--------	-------

Questo anno non avvengono fenomeni - No phenomena this year

# GEOMETRIE SPAZIALI LUNARI-TRIANGOLI EQUILATERI LUNAR SPATIAL GEOMETRIES-EQUILATERAL TRIANGLES

42°N - 12°E

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
------	------	--------	-----	-----	-----	-------	-----	------	------	------	------	-----	----	--------	-------

Questo anno non avvengono fenomeni - No phenomena this year

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

DQM = distanza media tra i 4 corpi, in gradi

MAX = distanza massima tra i 4 corpi, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

Si è considerato equilatero ogni triangolo in cui ogni cateto differisce dall'altro per massimo  $\pm 10\%$ .

Si è considerato quadrato ogni quadrilatero in cui ogni lato differisce dall'altro per massimo  $\pm 10\%$  e con diagonali diverse meno del 15%.

NB : queste tabelle sono state create esclusivamente ai fini di "foto d'effetto", con tre o quattro corpi celesti praticamente equidistanti!

Date in the format day/month/year

Dxy = distance between the body x and y, in °

DQM = middle distance between the 4 bodies, in °

MAX = maxima distance between the 4 bodies, in °

GROUP = least group, in degree

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

I have considered equilateral every triangle in which every cathetus differs from the other for maximum  $\pm 10\%$ .

I have considered square every quadrilateral in which every side differs from the other for maximum  $\pm 10\%$  and with diagonal different less than 15%.

NB: these charts are been created exclusively to the goals of "photo of effect", with three or four equidistant celestial bodies!

# GEOMETRIE SPAZIALI LUNARI – QUADRATI

## LUNAR SPATIAL GEOMETRIES – SQUARES

Geocentrici – geocentric

DATA ORA CORPI D12 D13 D14 D23 D24 D34 DQM MAX EL. MAG1 MAG2 MAG3 MAG4 MAGT

Questo anno non avvengono fenomeni – No phenomena this year

# GEOMETRIE SPAZIALI LUNARI – QUADRATI

## LUNAR SPATIAL GEOMETRIES – SQUARES

42°N – 12°E

DATA ORA CORPI D12 D13 D14 D23 D24 D34 DQM MAX EL. MAG1 MAG2 MAG3 MAG4 MAGT ALT AZ

Questo anno non avvengono fenomeni – No phenomena this year

Date, Time = data ed ora  
 Bodies = corpi  
 Dxy = distanza tra il corpo x e quello y, in gradi  
 DQM = distanza media tra i 4 corpi, in gradi  
 MAX = distanza massima tra i 4 corpi, in gradi  
 Group = cerchio minimo comprendente tutto il gruppo, in gradi  
 EL = elongazione dal Sole, in gradi  
 MAGx = magnitudine del corpo x  
 MAGT = magnitudine totale del gruppo  
 ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi  
 AZ = azimut del baricentro geometrico del gruppo, in gradi da nord  
 ALT.S. = altezza sull'orizzonte del Sole, in gradi  
 AZ.S. = azimut del Sole, in gradi da nord  
 Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
 Moon=Luna

Ore in T.U.

Si è considerato equilatero ogni triangolo in cui ogni cateto differisce dall'altro per massimo  $\pm 10\%$ .  
 Si è considerato quadrato ogni quadrilatero in cui ogni lato differisce dall'altro per massimo  $\pm 10\%$  e con diagonali diverse meno del 15%.

NB : queste tabelle sono state create esclusivamente ai fini di "foto d'effetto", con tre o quattro corpi celesti praticamente equidistanti!

Date in the format day/month/year  
 Dxy = distance between the body x and y, in °  
 DQM = middle distance between the 4 bodies, in °  
 MAX = maxima distance between the 4 bodies, in °  
 GROUP = least group, in degree  
 EL = elongation from the Sun, in °  
 MAGx = magnitude of body x  
 MAGT = total magnitude  
 ALT = height on the horizon of the baricenter of the group, in °  
 AZ = azimuth of the baricenter of the group, in ° from north  
 ALT.S. = height on the horizon of the Sun, in °  
 AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

I have considered equilateral every triangle in which every cathetus differs from the other for maximum  $\pm 10\%$ .  
 I have considered square every quadrilateral in which every side differs from the other for maximum  $\pm 10\%$  and with diagonal different less than 15%.

NB: these charts are been created exclusively to the goals of "photo of effect", with three or four equidistant celestial bodies!

# EVENTI GEOCENTRICI <5° LUNA-STELLE m<2

## GEOCENTRIC EVENTS <5° MOON-STARS m<2

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)			
2010/01/04	02:24:35	3.78626	1.28096	0.002	25	-134	-12.1	1.4		Moon	Alpha	LEO Regulus
2010/01/07	23:09:25	3.23762	1.21801	0.003	21	-84	-10.8	1.1		Moon	Alpha	VIR Spica
2010/01/11	13:11:01	1.07144	1.17079	0.003	185	-41	-9.3	1.1	1414	Moon	Alpha	SCO Antares
2010/01/23	18:59:43	4.90176	1.20239	0.003	342	94	-11.0	2.0		Moon	Alpha	ARI Hamal
2010/01/27	01:37:42	2.86370	1.26786	0.002	1	135	-12.1	1.7		Moon	Beta	TAU Elnath
2010/01/31	12:56:33	3.76739	1.29896	0.002	25	-162	-12.7	1.4		Moon	Alpha	LEO Regulus
2010/02/04	06:24:27	3.18906	1.23714	0.003	21	-111	-11.5	1.1		Moon	Alpha	VIR Spica
2010/02/07	18:58:01	1.12197	1.17566	0.003	185	-69	-10.3	1.1	1049	Moon	Alpha	SCO Antares
2010/02/20	01:29:31	5.03560	1.18926	0.003	342	66	-10.3	2.0		Moon	Alpha	ARI Hamal
2010/02/23	10:36:05	2.98936	1.24623	0.002	1	108	-11.4	1.7		Moon	Beta	TAU Elnath
2010/02/28	00:27:12	3.75178	1.29927	0.002	25	170	-12.8	1.4		Moon	Alpha	LEO Regulus
2010/03/03	16:02:08	3.04124	1.25607	0.002	21	-139	-12.2	1.1		Moon	Alpha	VIR Spica
2010/03/07	02:02:30	1.30913	1.18910	0.003	185	-97	-11.0	1.1		Moon	Alpha	SCO Antares
2010/03/22	16:59:26	3.22580	1.23027	0.003	1	81	-10.7	1.7		Moon	Beta	TAU Elnath
2010/03/27	10:31:58	3.84480	1.28315	0.002	24	143	-12.3	1.4		Moon	Alpha	LEO Regulus
2010/03/31	02:42:13	2.91931	1.26219	0.002	21	-165	-12.7	1.1		Moon	Alpha	VIR Spica
2010/04/03	10:48:35	1.55379	1.20295	0.003	185	-124	-11.7	1.1		Moon	Alpha	SCO Antares
2010/04/18	22:18:59	3.46580	1.22918	0.003	1	54	-9.9	1.7		Moon	Beta	TAU Elnath
2010/04/23	17:57:57	4.04309	1.26431	0.002	24	116	-11.6	1.4		Moon	Alpha	LEO Regulus
2010/04/27	12:25:00	2.91395	1.25388	0.002	21	166	-12.6	1.1		Moon	Alpha	VIR Spica
2010/04/30	20:17:13	1.73219	1.20881	0.003	185	-150	-12.3	1.1		Moon	Alpha	SCO Antares
2010/05/16	04:39:03	3.60825	1.23978	0.003	2	27	-8.5	1.7		Moon	Beta	TAU Elnath
2010/05/20	23:30:41	4.25228	1.25704	0.002	24	90	-10.9	1.4		Moon	Alpha	LEO Regulus
2010/05/24	20:00:22	3.00653	1.24018	0.003	21	140	-12.1	1.1		Moon	Alpha	VIR Spica
2010/05/28	05:02:54	1.78647	1.20500	0.003	184	-176	-12.6	1.1		Moon	Alpha	SCO Antares
2010/06/12	12:58:57	3.63678	1.25144	0.002	2	2	-2.8	1.7		Moon	Beta	TAU Elnath
2010/06/17	05:12:28	4.37528	1.26603	0.002	24	64	-10.3	1.4		Moon	Alpha	LEO Regulus
2010/06/21	01:47:41	3.09989	1.23309	0.003	21	114	-11.5	1.1		Moon	Alpha	VIR Spica
2010/06/24	12:14:43	1.76324	1.19681	0.003	184	157	-12.4	1.1		Moon	Alpha	SCO Antares
2010/07/09	22:50:18	3.62535	1.25419	0.002	2	-25	-8.3	1.7		Moon	Beta	TAU Elnath
2010/07/14	12:47:24	4.38452	1.28434	0.002	24	38	-9.2	1.4		Moon	Alpha	LEO Regulus
2010/07/18	07:20:01	3.10091	1.23958	0.003	21	88	-10.9	1.1		Moon	Alpha	VIR Spica
2010/07/21	18:04:39	1.76793	1.19228	0.003	184	131	-11.8	1.1		Moon	Alpha	SCO Antares
2010/08/06	08:48:46	3.67914	1.24439	0.002	2	-51	-9.8	1.7		Moon	Beta	TAU Elnath
2010/08/10	22:34:55	4.33948	1.29908	0.002	24	12	-6.8	1.4		Moon	Alpha	LEO Regulus
2010/08/14	14:21:23	2.98709	1.25722	0.002	21	62	-10.2	1.1		Moon	Alpha	VIR Spica
2010/08/17	23:41:27	1.87895	1.19724	0.003	184	105	-11.2	1.1		Moon	Alpha	SCO Antares
2010/09/02	17:23:38	3.85364	1.22672	0.003	2	-78	-10.6	1.7		Moon	Beta	TAU Elnath
2010/09/07	09:28:21	4.34416	1.29957	0.002	24	-15	-7.4	1.4		Moon	Alpha	LEO Regulus
2010/09/10	23:35:20	2.82398	1.27550	0.002	20	36	-9.1	1.1		Moon	Alpha	VIR Spica
2010/09/14	06:30:45	2.09990	1.21132	0.003	184	78	-10.6	1.1		Moon	Alpha	SCO Antares
2010/09/29	23:55:36	4.10857	1.21179	0.003	2	-104	-11.2	1.7		Moon	Beta	TAU Elnath
2010/10/04	19:36:01	4.46563	1.28437	0.002	24	-42	-9.5	1.4		Moon	Alpha	LEO Regulus
2010/10/08	10:15:55	2.72019	1.28254	0.002	20	10	-6.5	1.1		Moon	Alpha	VIR Spica
2010/10/11	15:15:14	2.34197	1.22722	0.003	184	52	-9.8	1.1		Moon	Alpha	SCO Antares
2010/10/27	05:18:50	4.33511	1.20877	0.003	2	-131	-11.9	1.7		Moon	Beta	TAU Elnath
2010/11/01	03:26:48	4.67185	1.26363	0.002	23	-69	-10.5	1.4		Moon	Alpha	LEO Regulus
2010/11/04	20:34:13	2.73783	1.27364	0.002	20	-19	-7.8	1.1		Moon	Alpha	VIR Spica
2010/11/08	01:17:15	2.49390	1.23507	0.003	184	24	-8.3	1.1		Moon	Alpha	SCO Antares
2010/11/23	11:31:24	4.44372	1.21752	0.003	2	-159	-12.5	1.7		Moon	Beta	TAU Elnath
2010/11/28	09:08:35	4.85127	1.25329	0.002	23	-96	-11.1	1.4		Moon	Alpha	LEO Regulus
2010/12/02	04:46:16	2.82901	1.25627	0.002	20	-46	-9.7	1.1		Moon	Alpha	VIR Spica
2010/12/05	10:57:12	2.52061	1.23023	0.003	184	-4	-4.4	1.1		Moon	Alpha	SCO Antares
2010/12/20	19:54:45	4.44771	1.22801	0.003	2	173	-12.7	1.7		Moon	Beta	TAU Elnath
2010/12/25	14:49:19	4.90906	1.26192	0.002	23	-124	-11.8	1.4		Moon	Alpha	LEO Regulus
2010/12/29	10:40:24	2.87160	1.24622	0.002	20	-74	-10.6	1.1		Moon	Alpha	VIR Spica

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della Luna

m\* = magnitudine della stella

tm = se presente, la stella viene occultata massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

R1 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in °

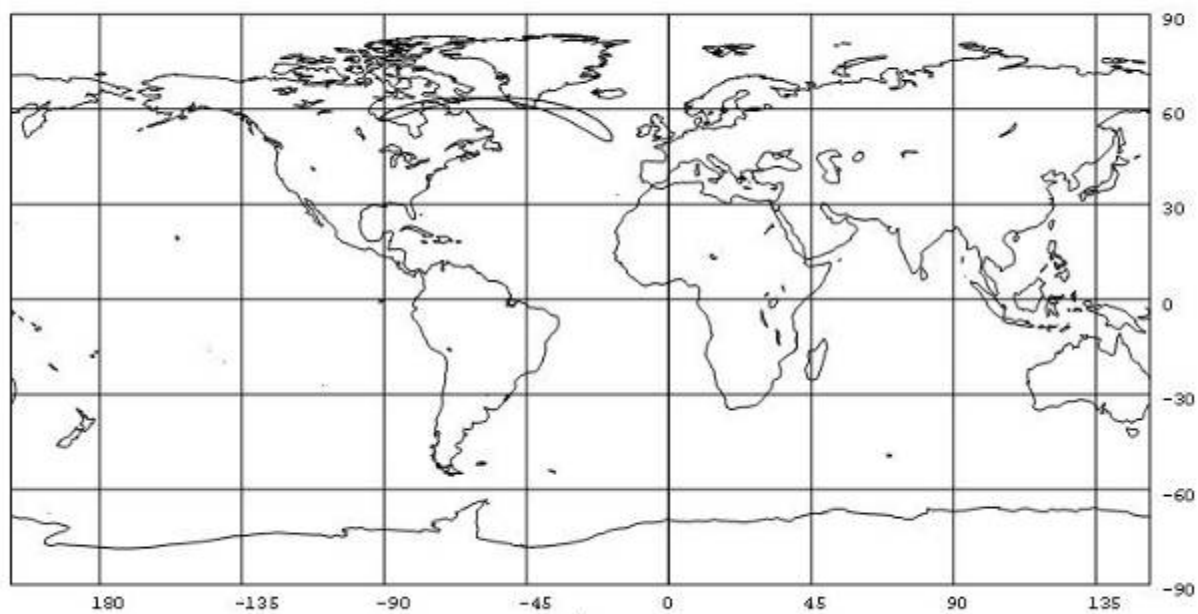
e = elongation, in °

m1 = magnitude of the Moon

m\* = magnitude of the star

tm = if present, the star is occulted maximum for x seconds

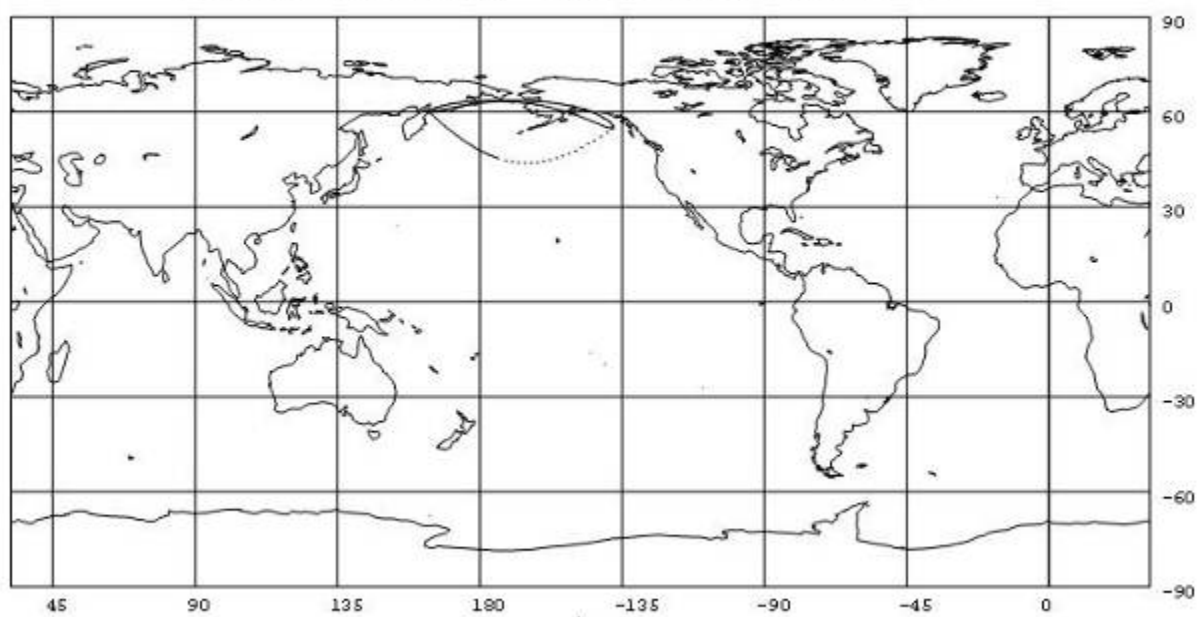
Occultation of 2366dM1, Magnitude 1.1, on 2010 Jan 11



Occult4.0.5.0

UT of conjunction = 13h 0.5m

Occultation of 2366dM1, Magnitude 1.1, on 2010 Feb 7



Occult4.0.5.0

UT of conjunction = 18h 47.0m

# EVENTI TOPOCENTRICI <5° LUNA-STELLE m<2

## TOPOCENTRIC EVENTS <5° MOON-STARS m<2

42°N - 12°E

Date	UT	Dm	Alt.	r1	p	e	m1	m*	tm(s)			
2010/01/04	00:35:50	4.20207	49.07	0.002	32	-134	-12.1	1.4		Moon	Alpha	LEO Regulus
2010/01/07	21:38:47	3.50048	-29.62	0.003	22	-84	-10.8	1.1		Moon	Alpha	VIR Spica
2010/01/11	14:15:44	0.46292	-15.97	0.003	176	-42	-9.3	1.1		Moon	Alpha	SCO Antares
2010/01/27	02:00:36	3.49208	19.15	0.002	9	135	-12.1	1.7		Moon	Beta	TAU Elnath
2010/02/04	06:07:57	4.08003	23.36	0.002	25	-111	-11.5	1.1		Moon	Alpha	VIR Spica
2010/02/23	10:09:44	3.76154	-6.28	0.002	356	108	-11.4	1.7		Moon	Beta	TAU Elnath
2010/02/27	22:52:58	4.34746	56.29	0.002	35	169	-12.8	1.4		Moon	Alpha	LEO Regulus
2010/03/07	01:00:49	0.64286	4.26	0.003	195	-96	-11.0	1.1		Moon	Alpha	SCO Antares
2010/03/22	16:53:28	3.50507	72.95	0.002	3	80	-10.7	1.7		Moon	Beta	TAU Elnath
2010/03/31	02:27:19	3.82317	24.14	0.002	25	-165	-12.7	1.1		Moon	Alpha	VIR Spica
2010/04/18	22:37:44	4.21880	-1.27	0.003	7	53	-9.9	1.7		Moon	Beta	TAU Elnath
2010/04/23	16:09:37	4.37787	37.83	0.002	29	116	-11.6	1.4		Moon	Alpha	LEO Regulus
2010/04/30	19:13:01	1.22824	-16.55	0.003	193	-150	-12.3	1.1		Moon	Alpha	SCO Antares
2010/05/16	04:19:34	4.40097	-10.49	0.003	357	28	-8.5	1.7		Moon	Beta	TAU Elnath
2010/05/24	17:39:02	3.59927	21.92	0.002	31	140	-12.1	1.1		Moon	Alpha	VIR Spica
2010/05/28	05:54:57	1.21773	-22.25	0.003	176	-176	-12.6	1.1		Moon	Alpha	SCO Antares
2010/06/12	12:51:01	3.97357	64.12	0.002	7	2	-2.4	1.7		Moon	Beta	TAU Elnath
2010/07/09	22:41:10	4.50657	-21.99	0.002	360	-25	-8.3	1.7		Moon	Beta	TAU Elnath
2010/07/14	10:57:44	4.74015	39.45	0.002	29	38	-9.2	1.4		Moon	Alpha	LEO Regulus
2010/07/21	17:27:33	1.00135	14.97	0.003	193	131	-11.8	1.1		Moon	Alpha	SCO Antares
2010/08/06	08:39:37	3.98922	68.97	0.002	5	-52	-9.8	1.7		Moon	Beta	TAU Elnath
2010/08/14	12:02:57	3.56535	20.09	0.002	30	62	-10.2	1.1		Moon	Alpha	VIR Spica
2010/08/18	00:32:29	1.31509	-22.18	0.003	176	105	-11.2	1.1		Moon	Alpha	SCO Antares
2010/09/02	17:26:10	4.73103	-23.77	0.003	2	-78	-10.6	1.7		Moon	Beta	TAU Elnath
2010/09/07	07:40:22	4.72586	42.43	0.002	29	-16	-7.4	1.4		Moon	Alpha	LEO Regulus
2010/09/29	23:53:06	4.58701	34.46	0.003	354	-104	-11.2	1.7		Moon	Beta	TAU Elnath
2010/10/08	08:08:08	3.27585	17.53	0.002	29	10	-6.4	1.1		Moon	Alpha	VIR Spica
2010/10/11	15:23:21	1.45567	21.70	0.003	183	52	-9.8	1.1		Moon	Alpha	SCO Antares
2010/10/27	05:00:38	4.74559	51.86	0.003	9	-132	-11.9	1.7		Moon	Beta	TAU Elnath
2010/11/01	01:52:59	4.97149	19.22	0.002	24	-69	-10.5	1.4		Moon	Alpha	LEO Regulus
2010/12/02	02:40:33	3.23031	-0.80	0.002	26	-46	-9.7	1.1		Moon	Alpha	VIR Spica
2010/12/05	10:56:27	1.63562	23.16	0.003	185	-4	-4.6	1.1		Moon	Alpha	SCO Antares
2010/12/20	19:55:54	4.83356	50.20	0.002	356	174	-12.7	1.7		Moon	Beta	TAU Elnath
2010/12/29	11:57:31	3.73145	-8.24	0.003	15	-73	-10.6	1.1		Moon	Alpha	VIR Spica

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Alt = altezza in gradi sull'orizzonte dell'evento nel momento centrale

R1 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della Luna

m\* = magnitudine della stella

tm = se presente, la stella viene occultata massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Alt = height in ° on the horizon of the event in the central moment

R1 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the Moon

m\* = magnitude of the star

tm = if present, the star is occulted maximum for x seconds



# OCCULTAZIONI LUNARI TOPOCENTRICHE m<6

## LUNAR TOPOCENTRIC OCCULTATIONS m<6

Data a m g	Ora h m s	P	StellaSp No D	Mag V	% Elon ill	Sole Luna Alt Alt Az
Occultazioni per ANCONA						
10 01 01 21 50	8 R		1193cA0	5.4	98-	164 51 116
10 01 03 23 19	37 r		1458 K2	5.9	85-	135 39 120
10 01 04 2 3	1 R		1468 M2	4.7s	85-	134 54 176
10 01 06 5 50	41 R		1713cK0	5.6	63-	105 -9 35 216
10 01 25 17 38	25 D		598SG0	5.5s	74+	118 65 136
10 01 28 18 50	52 D		1110SF0	3.5	97+	160 46 104
10 01 28 22 52	19 D		1129SF5	5.3	97+	161 65 209
10 01 31 0 48	24 R		1409cK0	5.0	99-	169 56 203
10 01 31 5 42	40 R		1428SA5	3.5	99-	166 -8 11 273
10 02 02 5 35	51 R		1670 K4	4.8	87-	138 -9 21 244
10 02 07 3 2	49 r		2273 B8	5.9v	38-	76 11 141
10 02 16 16 43	17 d		3482cF6	5.7	6+	28 -2 25 247
10 02 20 23 4	51 d	X	54005DA2	5.6	38+	76 4 296
10 02 20 23 4	53 D		440SA2	4.7	38+	76 4 296
10 02 23 0 28	1 d		743SA0	5.8	60+	102 11 294
10 02 25 19 46	57 D		1193cA0	5.4	88+	140 64 151
10 02 27 21 7	6 d		1458 K2	5.9	99+	168 51 145
10 02 27 23 32	19 D		1468 M2	4.7s	99+	169 52 203
10 03 09 5 20	26 D		2672wK1	2.8	35-	72 -2 19 164
10 03 09 6 34	33 R		2672wK1	2.8	35-	72 11 21 182
10 03 19 20 49	49 D		399SA0	5.7	15+	45 5 293
10 03 22 18 27	38 D		822SB9	5.8	42+	81 61 241
10 03 26 21 25	42 D		1409cK0	5.0	86+	135 55 208
10 03 27 2 14	28 D		1428SA5	3.5	87+	138 10 275
10 03 29 2 42	40 d		1670 K4	4.8	98+	165 14 252
10 04 24 23 10	42 d		1605 K3	6.0	84+	132 29 238
10 05 20 12 39	16 d		1428SA5	3.5	45+	85 59 25 101
10 06 06 2 9	43 D		3501 *5	5.0v	39-	77 -11 26 112
10 06 06 2 19	24 R		3501 *5	5.0v	39-	77 -10 28 114
10 06 23 20 17	41 d		2269cB5	5.4	93+	149 21 171
10 06 23 23 9	44 d		2286 B5	5.4v	93+	150 15 211
10 06 28 23 51	55 R		2987SF3	4.9	94-	152 26 160
10 07 02 23 11	41 g		3453wA0	5.0v	65-	108 16 103
10 07 07 3 15	59 r		399SA0	5.7	25-	60 -3 40 100
10 07 24 20 23	24 d		2822 A6	5.6	99+	167 19 152
10 07 25 0 32	39 d		2838cK1	5.6	99+	168 18 212
10 08 06 1 1	55 R		767SB2	5.5	21-	55 14 70
10 08 27 0 35	19 R		3501 *5	5.0v	95-	155 50 181
10 08 31 2 15	35 R		435 F5	5.8s	66-	109 63 141
10 09 05 2 44	19 R		1186 K1	6.0	15-	46 21 83
10 09 18 17 42	49 D		2987SF3	4.9	82+	129 -7 23 148
10 09 23 0 43	45 d		3482cF6	5.7	100+	174 40 224
10 09 30 4 29	33 R		839 B2	5.4s	60-	102 -7 70 195
10 10 01 23 3	11 R		1113wM0	5.1s	41-	79 6 68
10 10 02 1 9	51 R		1127cF2	5.9s	40-	78 28 88
10 10 18 23 11	24 D		3320SK2	5.0	85+	134 25 236
10 10 24 20 35	26 R		472cA1	4.9	97-	159 41 99
10 10 27 20 24	24 R		916SG7	4.3s	77-	123 12 69
10 10 27 22 57	7 R		929SB2	5.8v	76-	122 38 93
10 10 28 5 52	39 d		976SM3	2.9v	74-	119 2 49 253
10 10 28 6 17	10 R		976SM3	2.9v	74-	119 6 45 258
10 11 03 4 20	27 M		1713cK0	5.6	12-	41 19 118
10 11 16 20 11	10 D		3501 *5	5.0v	78+	124 48 203
10 11 23 0 47	31 r		742SG8	5.8	98-	164 68 212
10 11 24 4 32	44 R		916SG7	4.3s	94-	150 42 263
10 11 24 22 6	9 R		1047SA2	5.3	88-	140 40 98
10 11 25 20 36	4 R		1175cK5	4.9	81-	128 13 77
10 11 30 2 0	29 R		1670 K4	4.8	35-	73 19 114
10 12 03 4 26	34 R		2051 A*	5.9v	8-	32 5 122
10 12 21 18 4	43 R		976SM3	2.9v	100-	174 22 79
10 12 23 6 8	44 R		1175cK5	4.9	96-	156 -5 19 278
10 12 25 2 32	19 R		1410WK3	5.1	82-	130 56 183
10 12 31 3 45	20 R		2134SK4	5.9	18-	51 8 129

### Occultazioni per AOSTA

10 01 01 21 43	3 R		1193cA0	5.4	98-	164 45 110
10 01 03 23 12	27 r		1458 K2	5.9	85-	135 33 114
10 01 04 1 51	14 R		1468 M2	4.7s	85-	134 51 162
10 01 06 5 38	37 R		1713cK0	5.6	63-	105 36 205
10 01 25 17 14	50 D		598SG0	5.5s	74+	118 -9 57 121
10 01 27 17 19	23 d		936cK0	5.8	91+	145 -9 38 93
10 01 28 18 44	42 D		1110SF0	3.5	97+	160 41 100
10 01 28 22 40	52 D		1129SF5	5.3	97+	161 66 188
10 01 31 0 38	9 R		1409cK0	5.0	99-	169 55 187
10 01 31 5 38	47 R		1428SA5	3.5	99-	166 16 268
10 02 02 5 26	42 R		1670 K4	4.8	87-	138 25 236
10 02 07 2 56	19 r		2273 B8	5.9v	38-	76 6 136
10 02 20 23 3	37 D	X	54005DA2	5.6	38+	76 9 291
10 02 20 23 3	39 D		440SA2	4.7	38+	76 9 291
10 02 23 0 25	42 d		743SA0	5.8	60+	102 16 289
10 02 25 19 37	39 D		1193cA0	5.4	88+	140 59 138

Data a m g	Ora h m s	P	StellaSp No D	Mag V	% Elon ill	Sole Luna Alt Alt Az
10 02 27 20 58	18 d		1458 K2	5.9	99+	168 45 136
10 02 27 23 21	41 D		1468 M2	4.7s	99+	169 52 188
10 03 08 5 6	34 r		2524SB9	6.0	44-	83 -10 17 167
10 03 09 5 9	40 D		2672wK1	2.8	35-	72 -9 15 156
10 03 09 6 25	15 R		2672wK1	2.8	34-	72 4 19 174
10 03 19 20 48	27 D		399SA0	5.7	15+	45 10 288
10 03 22 18 16	57 D		822SB9	5.8	42+	81 -6 64 224
10 03 26 21 8	12 D		1409cK0	5.0	86+	135 55 189
10 03 27 2 10	22 D		1428SA5	3.5	87+	138 15 269
10 03 29 2 35	34 D		1670 K4	4.8	98+	165 18 245
10 04 24 23 4	32 d		1605 K3	6.0	84+	132 32 230
10 05 20 12 37	3 d		1428SA5	3.5	45+	85 61 20 97
10 06 23 20 6	35 d		2269cB5	5.4	93+	149 -7 18 163
10 06 23 22 57	23 d		2286 B5	5.4v	93+	150 16 203
10 06 28 23 45	2 R		2987SF3	4.9	94-	152 22 152
10 07 07 2 58	14 M		399SA0	5.7	25-	60 -8 32 94
10 07 24 20 15	48 d		2822 A6	5.6	99+	167 -10 14 145
10 07 25 0 27	38 d		2838cK1	5.6	99+	168 19 205
10 08 06 1 6	10 R		767SB2	5.5	21-	55 11 67
10 08 27 0 18	14 R		3501 *5	5.0v	95-	155 47 166
10 08 31 2 6	43 R		435 F5	5.8s	66-	109 57 130
10 09 23 0 23	10 d		3482cF6	5.7	100+	174 43 209
10 09 30 4 18	12 R		839 B2	5.4s	60-	102 68 172
10 10 01 23 7	12 r		1113wM0	5.1s	41-	79 4 65
10 10 02 1 11	0 R		1127cF2	5.9s	40-	78 24 85
10 10 18 23 4	1 D		3320SK2	5.0	85+	134 28 228
10 10 24 20 32	49 R		472cA1	4.9	97-	159 35 96
10 10 27 20 24	42 R		916SG7	4.3s	77-	123 9 66
10 10 27 22 56	19 R		929SB2	5.8v	76-	122 33 90
10 10 28 5 45	9 D		976SM3	2.9v	74-	119 -4 54 242
10 10 28 6 3	38 R		976SM3	2.9v	74-	119 -1 51 247
10 11 03 4 17	15 M		1713cK0	5.6	12-	41 14 113
10 11 16 19 56	7 D		3501 *5	5.0v	78+	124 48 188
10 11 21 5 5	44 d		472cA1	4.9	100+	172 12 288
10 11 23 0 33	53 r		742SG8	5.8	98-	164 68 188
10 11 24 4 24	34 R		916SG7	4.3s	94-	150 47 254
10 11 24 22 0	44 R		1047SA2	5.3	88-	140 35 94
10 11 25 20 43	55 r		1175cK5	4.9	81-	128 11 74
10 11 30 1 59	18 R		1670 K4	4.8	35-	73 14 109
10 12 07 16 43	30 m		2706 B8	5.8	4+	23 -10 5 229
10 12 13 17 22	25 D		3453wA0	5.0v	51+	91 46 178
10 12 21 18 7	1 R		976SM3	2.9v	100-	174 18 76
10 12 23 6 5	12 R		1175cK5	4.9	96-	156 -11 24 272
10 12 25 2 19	56 R		1410WK3	5.1	82-	130 53 168
10 12 31 3 43	10 r		2134SK4	5.9	18-	51 3 125

### Occultazioni per BARI

10	01	01	21	53	56	R	1193cA0	5.4	98-	164	55	118
10	01	03	23	25	26	r	1458 K2	5.9	85-	135	44	123
10	01	04	2	10	17	R	1468 M2	4.7s	85-	134	57	185
10	01	06	5	59	1	R	1713cK0	5.6	63-	105	-4	34 223
10	01	06	23	49	27	r	1800 A0	5.5	54-	95	10	112
10	01	20	15	47	45	d	3501 *5	5.0v	23+	58	0	50 207
10	01	28	18	55	52	D	1110SF0	3.5	97+	160	50	106
10	01	28	23	0	44	D	1129SF5	5.3	97+	161	65	224
10	01	31	0	56	21	R	1409cK0	5.0	99-	169	56	213
10	01	31	5	46	36	R	1428SA5	3.5	99-	166	-4	8 276
10	02	02	5	42	12	R	1670 K4	4.8	87-	138	-4	19 249
10	02	07	3	4	39	r	2273 B8	5.9v	38-	76	15	144
10	02	16	16	51	13	D	3482cF6	5.7	6+	28	-5	22 253
10	02	21	19	16	54	D	545 B6	4.1v	47+	87	52	256
10	02	21	19	39	22	r	545 B6	4.1v	47+	87	48	261
10	02	24	19	35	42	D	1050 K5	5.7	79+	126	72	187
10	02	25	19	52	25	D	1193cA0	5.4	88+	140	68	158
10	02	27	21	10	37	d	1458 K2	5.9	99+	168	54	150
10	02	27	23	40	10	D	1468 M2	4.7s	99+	169	53	213
10	03	02	0	51	59	r	1713cK0	5.6	97-	160	42	196
10	03	09	5	27	54	d	2672wK1	2.8	35-	72	2	23 169
10	03	09	6	38	2	R	2672wK1	2.8	35-	72	15	23 186
10	03	22	18	33	24	D	822SB9	5.8	42+	81	58	250
10	03	24	12	59	20	d	1110SF0	3.5	63+	105	42	24 81
10	03	26	21	33	22	D	1409cK0	5.0	86+	135	55	218
10	03	27	2	17	34	D	1428SA5	3.5	87+	138	6	278
10	03	29	2	49	10	d	1670 K4	4.8	98+	165	11	256
10	04	24	23	18	12	d	1605 K3	6.0	84+	132	27	244
10	05	20	12	41	1	d	1428SA5	3.5	45+	85	58	29 103
10	06	06	2	30	35	R	3501 *5	5.0v	39-	77	-9	33 118
10	06	23	20	23	45	D	2269cB5	5.4	93+	149	24	176
10	06	23	23	18	20	d	2286 B5	5.4v	93+	150	15	216
10	06	28	23	53	46	R	2987SF3	4.9	94-	152	30	163
10	07	02	23	23	7	R	3453wA0	5.0v	65-	108	21	107
10	07	07	3	20	59	r	399SA0	5.7	25-	60	-2	44 102
10	07	24	20	27	18	d	2822 A6	5.6	99+	167	23	155

Data a m g	Ora h m s	P	StellaSp No D	Mag V	% ill	Elon Alt	Sole Alt	Luna Alt Az
10 07 25	0 36 16	d	2838cK1	5.6	99+	168		19 216
10 08 06	0 57 11	R	767SB2	5.5	21-	55		14 70
10 08 27	0 42 32	R	3501 *5	5.0v	95-	155		52 190
10 08 31	2 18 22	R	435 F5	5.8s	66-	109		66 145
10 09 05	2 51 7	R	1186 K1	6.0	15-	46		24 85
10 09 18	17 58 30	D	2987SF3	4.9	82+	130		27 155
10 09 18	18 9 48	r	2987SF3	4.9	82+	130		28 158
10 09 30	4 35 23	R	839 B2	5.4s	60-	102	-3	71 211
10 10 01	22 58 46	R	1113wM0	5.1s	41-	79		7 69
10 10 02	1 6 17	R	1127cF2	5.9s	40-	78		30 88
10 10 18	23 17 27	D	3320SK2	5.0	85+	134		23 241
10 10 24	20 34 35	R	472cA1	4.9	97-	159		43 99
10 10 27	20 22 54	R	916SG7	4.3s	77-	123		13 71
10 10 27	22 54 45	R	929SB2	5.8v	76-	122		40 93
10 10 28	6 4 14	d	976SM3	2.9v	74-	119	7	45 261
10 10 28	6 20 27	R	976SM3	2.9v	74-	119	10	42 264
10 11 09	16 15 49	d	NGC6530 C	6.0	14+	44	-7	16 216
10 11 16	20 26 20	D	3501 *5	5.0v	78+	124		47 214
10 11 23	0 56 6	r	742SG8	5.8	98-	164		67 227
10 11 24	4 39 44	R	916SG7	4.3s	94-	150		38 269
10 11 24	22 8 23	R	1047SA2	5.3	88-	140		44 99
10 11 30	1 59 4	R	1670 K4	4.8	35-	73		22 115
10 12 03	4 27 50	R	2051 A*	5.9v	8-	32		9 125
10 12 21	18 0 50	R	976SM3	2.9v	100-	174		23 79
10 12 23	6 12 51	r	1175cK5	4.9	96-	156	-1	16 281
10 12 25	2 39 45	R	1410WK3	5.1	82-	130		58 193
10 12 31	3 45 43	R	2134SK4	5.9	18-	51		11 132

#### Occultazioni per BOLOGNA

10 01 01	21 47 35	R	1193cA0	5.4	98-	164		49 114
10 01 03	23 16 50	r	1458 K2	5.9	85-	135		37 118
10 01 04	1 58 47	R	1468 M2	4.7s	85-	134		53 171
10 01 06	5 46 21	R	1713cK0	5.6	63-	105	-11	35 212
10 01 25	17 26 39	D	598SG0	5.5s	74+	118		62 129
10 01 27	17 31 7	d	936cK0	5.8	91+	145		44 98
10 01 28	18 48 29	D	1110SF0	3.5	97+	160		44 103
10 01 28	22 48 8	D	1129SF5	5.3	97+	161		66 202
10 01 31	0 44 37	R	1409cK0	5.0	99-	169		56 197
10 01 31	5 41 11	R	1428SA5	3.5	99-	166	-10	13 271
10 02 02	5 32 36	R	1670 K4	4.8	87-	138	-11	22 241
10 02 07	3 0 38	r	2273 B8	5.9v	38-	76		9 139
10 02 20	23 4 31	d X	54005DA2	5.6	38+	76		6 294
10 02 20	23 4 32	D	440SA2	4.7	38+	76		6 294
10 02 23	0 27 14	d	743SA0	5.8	60+	102		13 292
10 02 25	19 43 34	D	1193cA0	5.4	88+	140		62 146
10 02 27	21 4 1	d	1458 K2	5.9	99+	168		49 142
10 02 27	23 28 23	D	1468 M2	4.7s	99+	169		52 198
10 03 08	5 14 13	r	2524SB9	6.0	44-	83	-5	19 173
10 03 09	5 16 23	D	2672wK1	2.8	35-	72	-5	18 161
10 03 09	6 31 28	R	2672wK1	2.8	34-	72	9	20 179
10 03 19	20 49 21	D	399SA0	5.7	15+	45		7 291
10 03 22	18 23 55	D	822SB9	5.8	42+	81	-11	62 235
10 03 26	21 19 10	D	1409cK0	5.0	86+	135		55 201
10 03 27	2 13 2	D	1428SA5	3.5	87+	138		11 273
10 03 29	2 39 58	d	1670 K4	4.8	98+	165		15 250
10 04 24	23 8 7	d	1605 K3	6.0	84+	132		30 235
10 05 20	12 38 22	d	1428SA5	3.5	45+	85	60	24 100
10 06 06	2 14 21	M	3501 *5	5.0v	39-	77	-11	25 111
10 06 23	20 13 42	d	2269cB5	5.4	93+	149	-10	20 168
10 06 23	23 5 17	d	2286 B5	5.4v	93+	150		16 208
10 06 28	23 49 40	R	2987SF3	4.9	94-	152		25 157
10 07 02	23 12 13	m	3453wA0	5.0v	65-	108		14 102
10 07 07	3 11 24	R	399SA0	5.7	25-	60	-5	38 98
10 07 24	20 20 40	d	2822 A6	5.6	99+	167		17 150
10 07 25	0 30 45	d	2838cK1	5.6	99+	168		18 209
10 08 06	1 3 36	R	767SB2	5.5	21-	55		13 69
10 08 27	0 29 51	R	3501 *5	5.0v	95-	155		49 176
10 08 31	2 12 41	R	435 F5	5.8s	66-	109		61 137
10 09 05	2 37 51	R	1186 K1	6.0	15-	46		18 80
10 09 18	17 37 59	D	2987SF3	4.9	82+	129	-4	21 145
10 09 23	0 35 7	d	3482cF6	5.7	100+	174		41 218
10 09 30	4 25 30	R	839 B2	5.4s	60-	102	-9	69 187
10 10 01	23 4 49	R	1113wM0	5.1s	41-	79		6 67
10 10 02	1 10 30	R	1127cF2	5.9s	40-	78		26 87
10 10 18	23 8 38	D	3320SK2	5.0	85+	134		26 234
10 10 24	20 34 41	R	472cA1	4.9	97-	159		39 98
10 10 27	20 24 39	R	916SG7	4.3s	77-	123		11 68
10 10 27	22 57 6	R	929SB2	5.8v	76-	122		36 92
10 10 28	5 49 18	d	976SM3	2.9v	74-	119	0	51 249
10 10 28	6 13 0	R	976SM3	2.9v	74-	119	4	47 255
10 11 03	4 19 13	M	1713cK0	5.6	12-	41		17 116
10 11 16	20 5 14	D	3501 *5	5.0v	78+	124		48 198
10 11 23	0 42 40	r	742SG8	5.8	98-	164		68 204
10 11 24	4 29 43	R	916SG7	4.3s	94-	150		44 260
10 11 24	22 4 19	R	1047SA2	5.3	88-	140		38 97
10 11 25	20 39 31	r	1175cK5	4.9	81-	128		12 76
10 11 30	2 0 8	R	1670 K4	4.8	35-	73		17 112
10 12 03	4 26 17	R	2051 A*	5.9v	8-	32		4 121
10 12 13	17 48 12	M	3453wA0	5.0v	51+	91		46 193
10 12 21	18 5 45	R	976SM3	2.9v	100-	174		20 78
10 12 23	6 7 22	R	1175cK5	4.9	96-	156	-7	21 276

Data a m g	Ora h m s	P	StellaSp No D	Mag V	% ill	Elon Alt	Sole Alt	Luna Alt Az
10 12 25	2 27 52	R	1410WK3	5.1	82-	130		55 178
10 12 31	3 44 34	R	2134SK4	5.9	18-	51		6 128

#### Occultazioni per CAGLIARI

10	01	01	21	41	23	R	1193cA0	5.4	98-	164		48	105
10	01	03	23	18	31	r	1458 K2	5.9	85-	135		38	113
10	01	04	1	49	13	R	1468 M2	4.7s	85-	134		58	161
10	01	06	5	48	20	R	1713cK0	5.6	63-	105	-10	40	212
10	01	28	18	46	17	D	1110SF0	3.5	97+	160		43	96
10	01	28	22	55	5	D	1129SF5	5.3	97+	161		71	206
10	01	31	0	48	50	R	1409cK0	5.0	99-	169		61	197
10	01	31	5	49	43	R	1428SA5	3.5	99-	166	-8	13	272
10	02	02	5	37	6	R	1670 K4	4.8	87-	138	-11	26	242
10	02	07	2	37	1	r	2273 B8	5.9v	38-	76		9	133
10	02	20	23	6	27	d X	54005DA2	5.6	38+	76		5	294
10	02	20	23	6	28	D	440SA2	4.7	38+	76		5	294
10	02	21	18	53	7	D	545 B6	4.1v	47+	87		62	245
10	02	21	19	43	38	r	545 B6	4.1v	47+	87		53	258
10	02	21	20	43	14	D	560cB8	3.6s	48+	87		42	268
10	02	21	20	59	9	r	560cB8	3.6s	48+	87		39	271
10	02	23	0	31	47	d	743SA0	5.8	60+	102		12	293
10	02	24	19	4	26	D	1050 K5	5.7	79+	126		71	140
10	02	25	19	37	36	D	1193cA0	5.4	88+	140		64	132
10	02	27	20	52	21	d	1458 K2	5.9	99+	168		50	131
10	02	27	23	33	11	D	1468 M2	4.7s	99+	169		58	199
10	03	08	5	9	42	r	2524SB9	6.0	44-	83	-8	24	169
10	03	09	5	11	28	D	2672wK1	2.8	35-	72	-7	22	157
10	03	09	6	21	37	R	2672wK1	2.8	35-	72	6	25	174
10	03	19	20	55	4	D	399SA0	5.7	15+	45		6	291
10	03	22	18	18	32	D	822SB9	5.8	42+	81	-9	67	239
10	03	24	12	57	32	d	1110SF0	3.5	63+	105	47	17	76
10	03	26	21	7	57	D	1409cK0	5.0	86+	135		61	195
10	03	27	2	18	43	D	1428SA5	3.5	87+	138		12	273
10	03	29	2	50	46	d	1670 K4	4.8	98+	165		17	252
10	04	29	23	13	52	R	2237 K3	5.0s	97-	160		24	160
10	05	20	12	35	34	d	1428SA5	3.5	45+	85	65	22	95
10	06	06	2	12	44	R	3501 *5	5.0v	39-	77		25	107
10	06	23	20	5	20	D	2269cB5	5.4	93+	149	-12	25	164
10	06	23	23	7	5	d	2286 B5	5.4v	93+	150		21	207
10	06	28	23	37	33	R	2987SF3	4.9	94-	152		28	151
10	07	02	23	13	14	R	3453wA0	5.0v	65-	108		14	99
10	07	07	3	7	37	R	399SA0	5.7	25-	60	-10	36	92
10	07	24	0	48	15	d	2692 K3	5.5	96+	157		15	221
10	07	24	20	10	53	d	2822 A6	5.6	99+	167		20	145
10	07	25	0	27	7	d	2838cK1	5.6	99+	168		24	207
10	08	06	0	56	56	R	767SB2	5.5	21-	55		8	65
10	08	27	0	23	15	R	3501 *5	5.0v	95-	155		54	169
10	08	31	2	2	18	R	435 F5	5.8s	66-	109		61	122
10	09	05	2	46	30	R	1186 K1	6.0	15-	46		17	79
10	09	18	17	36	22	D	2987SF3	4.9	82+	130	-3	24	142
10	09	30	4	15	52	R	839 B2	5.4s	61-	102		75	172
10	10	02	1	0	20	r	1127cF2	5.9s	40-	78		22	82
10	10	18	23	9	14	D	3320SK2	5.0	85+	134		31	234
10	10	24	20	25	16	R	472cA1	4.9	97-	159		36	91
10	10	27	20	21	23	r	916SG7	4.3s	77-	123		7	65
10	10	27	22	46	35	R	929SB2	5.8v	76-	122		33	85
10	11	16	20	3	43	D	3501 *5	5.0v	78+	124		53	195
10	11	23	0	41	31	R	742SG8	5.8	98-	164		74	203
10	11	24	4	39	31	R	916SG7	4.3s	93-	150		44	265
10	11	24	21	58	39	R	1047SA2	5.3	88-	140		36	90
10	11	30	1	44	10	R	1670 K4	4.8	36-	73		14	106
10	12	03	4	27	9	R	2051 A*	5.9v	8-	32		5	119
10	12	21	17	57	50	R	976MS3	2.9v	100-	174		16	74
10	12	23	6	17	36	R	1175cK5	4.9	96-	156	-5	20	278
10	12	25	2	17	19	R	1410WK3	5.1	82-	131		60	168
10	12	31	3	34	43	R	2134SA4	5.9	19-	51		6	126

Data a m g	Ora h m s	P	StellaSp No D	Mag V	% ill	Elon Alt	Sole Alt	Luna Alt Az
10 03 09	5 22 48	D	2672wK1	2.8	35-	72	-1 22	165
10 03 09	6 34 48	R	2672wK1	2.8	35-	72	12 23	183
10 03 19	20 51 27	d	399SA0	5.7	15+	45		3 294
10 03 22	18 29 14	D	822SB9	5.8	42+	81		60 246
10 03 24	13 3 54	d	1110SF0	3.5	63+	105	42 23	81
10 03 26	21 25 23	D	1409cK0	5.0	86+	135		56 211
10 03 27	2 16 56	D	1428SA5	3.5	87+	138		8 276
10 03 29	2 47 29	d	1670 K4	4.8	98+	165		13 254
10 04 24	23 16 49	d	1605 K3	6.0	84+	132		28 242
10 05 20	12 39 22	d	1428SA5	3.5	45+	85	60 27	101
10 06 06	2 25 7	R	3501 *5	5.0v	39-	77	-10 31	115
10 06 23	20 19 0	D	2269cB5	5.4	93+	149		24 173
10 06 23	23 14 9	d	2286 B5	5.4v	93+	150		16 213
10 06 28	23 50 46	R	2987SF3	4.9	94-	152		28 160
10 07 02	23 19 41	R	3453wA0	5.0v	65-	108		18 105
10 07 07	3 17 33	R	399SA0	5.7	25-	60	-4 41	100
10 07 24	20 23 24	d	2822 A6	5.6	99+	167		21 153
10 07 25	0 33 51	d	2838cK1	5.6	99+	168		19 213
10 08 06	0 58 30	R	767SB2	5.5	21-	55		13 69
10 08 27	0 37 37	R	3501 *5	5.0v	95-	155		52 184
10 08 31	2 15 3	R	435 F5	5.8s	66-	109		65 140
10 09 05	2 48 41	R	1186 K1	6.0	15-	46		22 83
10 09 18	17 47 35	D	2987SF3	4.9	82+	129	-9 25	150
10 09 30	4 30 52	R	839 B2	5.4s	60-	102	-6 71	201
10 10 01	23 0 8	R	1113wM0	5.1s	41-	79		6 68
10 10 02	1 6 23	R	1127cF2	5.9s	40-	78		28 87
10 10 18	23 14 24	D	3320SK2	5.0	85+	134		25 239
10 10 24	20 33 19	R	472cA1	4.9	97-	159		41 98
10 10 27	20 23 4	R	916SG7	4.3s	77-	123		12 69
10 10 27	22 54 5	R	929SB2	5.8v	76-	122		38 92
10 10 28	6 9 43	G	976SM3	2.9v	74-	119	7 46	260
10 11 09	16 12 59	d	NGC6530 C	6.0	14+	44	-5 17	213
10 11 16	20 17 40	D	3501 *5	5.0v	78+	124		49 208
10 11 23	0 51 34	r	742SG8	5.8	98-	164		68 220
10 11 24	4 37 58	R	916SG7	4.3s	94-	150		40 267
10 11 24	22 6 8	R	1047SA2	5.3	88-	140		41 97
10 11 25	20 27 30	r	1175cK5	4.9	81-	128		12 76
10 11 30	1 57 29	R	1670 K4	4.8	35-	73		20 113
10 12 03	4 27 31	R	2051 A*	5.9v	8-	32		7 123
10 12 21	18 1 29	R	976SM3	2.9v	100-	174		21 78
10 12 23	6 12 33	r	1175cK5	4.9	96-	156	-3 17	280
10 12 25	2 34 42	R	1410WK3	5.1	82-	130		58 187
10 12 31	3 43 56	R	2134SK4	5.9	18-	51		9 130

#### Occultazioni per CATANZARO

10 01 01	21 52 7	R	1193cA0	5.4	98-	164		56 114
10 01 03	23 27 0	R	1458 K2	5.9	85-	135		45 122
10 01 04	2 9 40	R	1468 M2	4.7s	85-	134		59 185
10 01 06	6 1 42	r	1713cK0	5.6	63-	105	-3 35	224
10 01 06	23 53 1	r	1800 A0	5.5	54-	95		11 112
10 01 28	18 57 19	D	1110SF0	3.5	97+	160		51 103
10 01 28	23 4 33	D	1129SF5	5.3	97+	161		66 228
10 01 31	0 59 49	R	1409cK0	5.0	99-	169		58 216
10 01 31	5 50 6	r	1428SA5	3.5	99-	166	-3 7	277
10 02 02	5 44 59	R	1670 K4	4.8	87-	138	-3 19	250
10 02 07	2 59 7	r	2273 B8	5.9v	38-	76		16 143
10 02 16	16 56 42	D	3482cF6	5.7	6+	28	-5 22	254
10 02 21	19 7 35	D	545 B6	4.1v	47+	87		54 257
10 02 21	19 51 11	r	545 B6	4.1v	47+	87		46 265
10 02 24	19 22 5	D	1050 K5	5.7	79+	126		75 175
10 02 25	19 51 47	D	1193cA0	5.4	88+	140		69 155
10 02 27	21 7 6	d	1458 K2	5.9	99+	168		56 146
10 02 27	23 43 5	D	1468 M2	4.7s	99+	169		54 215
10 03 09	5 28 4	d	2672wK1	2.8	35-	72	2 25	168
10 03 09	6 35 1	R	2672wK1	2.8	35-	72	14 26	185
10 03 22	18 33 3	D	822SB9	5.8	42+	81		59 253
10 03 24	12 51 19	d	1110SF0	3.5	63+	105	45 22	79
10 03 26	21 28 31	D	1409cK0	5.0	86+	135		57 218
10 03 27	2 19 55	D	1428SA5	3.5	87+	138		6 278
10 03 29	2 54 4	d	1670 K4	4.8	98+	165		11 257
10 04 24	23 25 7	d	1605 K3	6.0	84+	132		27 246
10 05 16	8 59 30	D	Venus	-4.0	7+	30	59 38	87
10 05 16	9 10 31	R	Venus	-4.0	7+	30	61 40	89
10 05 20	12 40 56	d	1428SA5	3.5	45+	85	60 29	101
10 06 06	2 29 8	R	3501 *5	5.0v	39-	77	-10 34	116
10 06 23	20 22 5	D	2269cB5	5.4	93+	149		27 175
10 06 23	23 21 4	d	2286 B5	5.4v	93+	150		17 217
10 06 28	23 49 41	R	2987SF3	4.9	94-	152		31 162
10 07 02	23 22 7	R	3453wA0	5.0v	65-	108		21 106
10 07 07	3 18 56	R	399SA0	5.7	25-	60	-4 44	99
10 07 24	20 24 49	d	2822 A6	5.6	99+	167		25 154
10 07 25	0 36 27	d	2838cK1	5.6	99+	168		20 216
10 08 06	0 53 38	R	767SB2	5.5	21-	55		13 69
10 08 27	0 40 43	R	3501 *5	5.0v	95-	155		54 189
10 08 31	2 14 29	R	435 F5	5.8s	66-	109		68 139
10 09 05	2 52 14	R	1186 K1	6.0	15-	46		24 84
10 09 18	18 0 27	M	2987SF3	4.9	82+	130		29 155
10 09 30	4 32 43	R	839 B2	5.4s	61-	102	-4 73	212
10 10 01	22 55 30	R	1113wM0	5.1s	41-	79		5 68
10 10 02	1 0 52	R	1127cF2	5.9s	40-	78		28 86

Data a m g	Ora h m s	P	StellaSp No D	Mag V	% ill	Elon Alt	Sole Alt	Luna Alt Az
10 10 18	23 20 0	D	3320SK2	5.0	85+	134		24 243
10 10 24	20 30 34	R	472cA1	4.9	97-	159		43 96
10 10 27	20 20 59	R	916SG7	4.3s	77-	123		12 70
10 10 27	22 49 38	R	929SB2	5.8v	76-	122		39 90
10 11 09	16 16 37	d	NGC6530 C	6.0	14+	44	-7 18	216
10 11 16	20 40 12	D	3501 *5	5.0v	78+	124		48 220
10 11 16	20 48 10	R	3501 *5	5.0v	78+	124		47 223
10 11 23	0 57 8	r	742SG8	5.8	98-	164		68 232
10 11 24	4 44 28	R	916SG7	4.3s	94-	150	-12 38	271
10 11 24	22 5 58	R	1047SA2	5.3	88-	140		43 96
10 11 30	1 52 48	R	1670 K4	4.8	35-	73		21 113
10 12 03	4 28 39	R	2051 A*	5.9v	8-	32		10 124
10 12 21	17 56 43	R	976SM3	2.9v	100-	174		21 78
10 12 25	2 38 58	R	1410WK3	5.1	82-	130		60 193
10 12 31	3 42 39	R	2134SK4	5.9	18-	51		12 131

#### Occultazioni per FIRENZE

10 01 01	21 47 11	R	1193cA0	5.4	98-	164		49 113
10 01 03	23 17 30	r	1458 K2	5.9	85-	135		38 118
10 01 04	1 58 27	R	1468 M2	4.7s	85-	134		54 170
10 01 06	5 47 5	R	1713cK0	5.6	63-	105	-11 36	212
10 01 25	17 29 2	D	598SG0	5.5s	74+	118		63 129
10 01 28	18 48 12	D	1110SF0	3.5	97+	160		44 102
10 01 28	22 49 4	D	1129SF5	5.3	97+	161		66 203
10 01 31	0 45 37	R	1409cK0	5.0	99-	169		56 197
10 01 31	5 42 27	R	1428SA5	3.5	99-	166	-9 13	272
10 02 02	5 33 32	R	1670 K4	4.8	87-	138	-11 23	241
10 02 07	2 58 52	r	2273 B8	5.9v	38-	76		9 139
10 02 20	23 4 39	d	X 54005DA2	5.6	38+	76		6 294
10 02 20	23 4 41	D	440SA2	4.7	38+	76		6 294
10 02 23	0 27 48	d	743SA0	5.8	60+	102		13 293
10 02 25	19 42 52	D	1193cA0	5.4	88+	140		62 144
10 02 27	21 2 13	d	1458 K2	5.9	99+	168		49 141
10 02 27	23 29 11	D	1468 M2	4.7s	99+	169		53 198
10 03 08	5 14 7	r	2524SB9	6.0	44-	83	-6 20	173
10 03 09	5 16 2	D	2672wK1	2.8	35-	72	-5 19	161
10 03 09	6 30 42	R	2672wK1	2.8	35-	72	9 21	179
10 03 19	20 50 0	D	399SA0	5.7	15+	45		7 291
10 03 22	18 23 17	D	822SB9	5.8	42+	81	-10 63	236
10 03 26	21 17 20	D	1409cK0	5.0	86+	135		56 201
10 03 27	2 13 52	D	1428SA5	3.5	87+	138		11 273
10 03 29	2 41 27	d	1670 K4	4.8	98+	165		15 250
10 04 24	23 10 13	d	1605 K3	6.0	84+	132		30 236
10 05 20	12 37 52	d	1428SA5	3.5	45+	85	60 24	99
10 06 06	2 12 49	M	3501 *5	5.0v	39-	77		25 111
10 06 23	20 12 59	d	2269cB5	5.4	93+	149	-11 21	168
10 06 23	23 5 54	d	2286 B5	5.4v	93+	150		16 208
10 06 28	23 48 29	R	2987SF3	4.9	94-	152		25 157
10 07 02	23 10 44	m	3453wA0	5.0v	65-	108		14 102
10 07 07	3 11 27	R	399SA0	5.7	25-	60	-5 38	98
10 07 24	20 19 40	d	2822 A6	5.6	99+	167		18 149
10 07 25	0 30 29	d	2838cK1	5.6	99+	168		19 209
10 08 06	1 2 38	R	767SB2	5.5	21-	55		12 68
10 08 27	0 29 41	R	3501 *5	5.0v	95-	155		50 175
10 08 31	2 11 46	R	435 F5	5.8s	66-	109		61 135
10 09 05	2 41 7	R	1186 K1	6.0	15-	46		

Data a m g	Ora h m s	P	StellaSp No D	Mag V	% ill	Elon Alt	Sole Alt	Luna Alt Az	Data a m g	Ora h m s	P	StellaSp No D	Mag V	% ill	Elon Alt	Sole Alt	Luna Alt Az
10 01 31	0 41 53	R	1409cK0	5.0	99-	169		56 191	10 07 02	23 17 13	R	3453wA0	5.0v	65-	108		17 104
10 01 31	5 41 11	R	1428SA5	3.5	99-	166	-11	15 270	10 07 07	3 15 41	r	399SA0	5.7	25-	60	-4	40 99
10 02 02	5 30 14	R	1670 K4	4.8	87-	138		24 239	10 07 24	20 21 52	d	2822 A6	5.6	99+	167		20 151
10 02 07	2 56 1	r	2273 B8	5.9v	38-	76		7 137	10 07 25	0 32 30	d	2838cK1	5.6	99+	168		19 212
10 02 20	23 4 15	d	54005DA2	5.6	38+	76		7 293	10 08 06	1 0 2	R	767SB2	5.5	21-	55		13 69
10 02 20	23 4 16	D	440SA2	4.7	38+	76		7 293	10 08 27	0 34 54	R	3501 *5	5.0v	95-	155		51 181
10 02 23	0 27 3	d	743SA0	5.8	60+	102		15 291	10 08 31	2 13 55	R	435 F5	5.8s	66-	109		63 138
10 02 25	19 39 13	D	1193cA0	5.4	88+	140		60 140	10 09 05	2 46 28	R	1186 K1	6.0	15-	46		21 82
10 02 27	20 58 41	d	1458 K2	5.9	99+	168		47 137	10 09 18	17 43 17	D	2987SF3	4.9	82+	129	-7	24 148
10 02 27	23 25 18	D	1468 M2	4.7s	99+	169		53 193	10 09 23	0 49 33	d	3482cF6	5.7	100+	174		40 226
10 03 08	5 9 29	r	2524SB9	6.0	44-	83	-8	19 170	10 09 30	4 28 44	R	839 B2	5.4s	60-	102	-7	71 195
10 03 09	5 11 55	D	2672wK1	2.8	35-	72	-7	17 158	10 10 01	23 1 35	R	1113wM0	5.1s	41-	79		6 67
10 03 09	6 27 0	R	2672wK1	2.8	34-	72		6 20 176	10 10 02	1 7 29	R	1127cF2	5.9s	40-	78		27 87
10 03 19	20 49 38	D	399SA0	5.7	15+	45		8 290	10 10 18	23 12 16	D	3320SK2	5.0	85+	134		26 237
10 03 22	18 19 5	D	822SB9	5.8	42+	81	-8	64 229	10 10 24	20 33 28	R	472cA1	4.9	97-	159		40 98
10 03 26	21 10 57	D	1409cK0	5.0	86+	135		56 194	10 10 27	20 23 32	R	916SG7	4.3s	77-	123		11 69
10 03 27	2 12 28	D	1428SA5	3.5	87+	138		13 271	10 10 27	22 54 51	R	929SB2	5.8v	76-	122		38 92
10 03 29	2 39 1	d	1670 K4	4.8	98+	165		17 248	10 10 28	6 3 54	G	976SM3	2.9v	74-	119	4	48 257
10 04 24	23 8 20	d	1605 K3	6.0	84+	132		32 233	10 11 16	20 12 27	D	3501 *5	5.0v	78+	124		49 204
10 05 20	12 36 53	d	1428SA5	3.5	45+	85	61	22 97	10 11 23	0 48 31	r	742SG8	5.8	98-	164		69 214
10 06 23	20 8 39	d	2269cB5	5.4	93+	149	-9	20 165	10 11 24	4 35 39	R	916SG7	4.3s	94-	150		42 265
10 06 23	23 1 18	d	2286 B5	5.4v	93+	150		17 205	10 11 24	22 5 17	R	1047SA2	5.3	88-	140		40 97
10 06 28	23 45 36	R	2987SF3	4.9	94-	152		24 154	10 11 25	20 31 56	r	1175cK5	4.9	81-	128		12 76
10 07 02	23 10 55	m	3453wA0	5.0v	65-	108		12 100	10 11 30	1 57 55	R	1670 K4	4.8	35-	73		19 113
10 07 07	3 5 14	R	399SA0	5.7	25-	60	-7	35 95	10 12 03	4 27 7	R	2051 A*	5.9v	8-	32		6 122
10 07 24	20 16 37	d	2822 A6	5.6	99+	167		16 147	10 12 21	18 2 42	R	976SM3	2.9v	100-	174		21 78
10 07 25	0 28 28	d	2838cK1	5.6	99+	168		20 207	10 12 23	6 11 15	R	1175cK5	4.9	96-	156	-4	19 278
10 08 06	1 4 4	R	767SB2	5.5	21-	55		11 67	10 12 25	2 31 58	R	1410WK3	5.1	82-	130		57 183
10 08 27	0 23 22	R	3501 *5	5.0v	95-	155		49 170	10 12 31	3 43 44	R	2134SK4	5.9	18-	51		8 129
10 08 31	2 8 19	R	435 F5	5.8s	66-	109		59 131	Occultazioni per MILANO								
10 09 18	17 33 18	d	2987SF3	4.9	82+	129	-1	19 142	10 01 01	21 45 9	R	1193cA0	5.4	98-	164		47 112
10 09 23	0 28 57	d	3482cF6	5.7	100+	174		43 213	10 01 03	23 14 9	r	1458 K2	5.9	85-	135		35 116
10 09 30	4 20 44	R	839 B2	5.4s	60-	102	-11	70 177	10 01 04	1 54 42	R	1468 M2	4.7s	85-	134		52 166
10 10 01	23 5 22	r	1113wM0	5.1s	41-	79		4 65	10 01 06	5 41 52	R	1713cK0	5.6	63-	105		35 208
10 10 02	1 9 32	R	1127cF2	5.9s	40-	78		25 85	10 01 25	17 19 16	D	598SG0	5.5s	74+	118	-10	59 124
10 10 18	23 6 0	D	3320SK2	5.0	85+	134		28 231	10 01 27	17 22 51	d	936cK0	5.8	91+	145	-11	40 95
10 10 24	20 32 26	R	472cA1	4.9	97-	159		37 96	10 01 28	18 46 28	D	1110SF0	3.5	97+	160		42 101
10 10 27	20 24 19	R	916SG7	4.3s	77-	123		9 66	10 01 28	22 43 50	D	1129SF5	5.3	97+	161		65 194
10 10 27	22 55 22	R	929SB2	5.8v	76-	122		34 90	10 01 31	0 40 43	R	1409cK0	5.0	99-	169		55 191
10 10 28	5 58 37	G	976SM3	2.9v	74-	119	0	51 249	10 01 31	5 39 26	R	1428SA5	3.5	99-	166	-12	15 269
10 11 16	19 59 42	D	3501 *5	5.0v	78+	124		49 192	10 02 02	5 29 4	R	1670 K4	4.8	87-	138		24 238
10 11 21	5 7 2	d	472cA1	4.9	100+	172		10 290	10 02 07	2 58 54	r	2273 B8	5.9v	38-	76		7 138
10 11 23	0 38 14	r	742SG8	5.8	98-	164		69 195	10 02 20	23 4 1	d	54005DA2	5.6	38+	76		8 293
10 11 24	4 28 36	R	916SG7	4.3s	94-	150		46 258	10 02 20	23 4 2	D	440SA2	4.7	38+	76		8 293
10 11 24	22 1 49	R	1047SA2	5.3	88-	140		36 94	10 02 23	0 26 12	d	743SA0	5.8	60+	102		15 291
10 11 25	20 40 20	r	1175cK5	4.9	81-	128		11 75	10 02 25	19 40 34	D	1193cA0	5.4	88+	140		60 142
10 11 30	1 58 7	R	1670 K4	4.8	35-	73		15 110	10 02 27	21 1 31	d	1458 K2	5.9	99+	168		47 139
10 12 03	4 26 28	r	2051 A*	5.9v	8-	32		2 119	10 02 27	23 24 24	D	1468 M2	4.7s	99+	169		52 193
10 12 13	17 32 33	D	3453wA0	5.0v	51+	91		47 184	10 03 08	5 10 0	r	2524SB9	6.0	44-	83	-8	18 170
10 12 21	18 5 24	R	976SM3	2.9v	100-	174		19 76	10 03 09	5 12 45	D	2672wK1	2.8	35-	72	-7	16 158
10 12 23	6 7 46	R	1175cK5	4.9	96-	156	-9	23 274	10 03 09	6 28 21	R	2672wK1	2.8	34-	72	6	19 176
10 12 25	2 22 42	R	1410WK3	5.1	82-	130		55 171	10 03 19	20 48 40	D	399SA0	5.7	15+	45		9 290
10 12 31	3 42 34	r	2134SK4	5.9	18-	51		4 126	10 03 22	18 20 23	D	822SB9	5.8	42+	81	-8	63 229
Occultazioni per L'AQUILA									10 03 26	21 13 39	D	1409cK0	5.0	86+	135		55 195
10 01 01	21 49 24	R	1193cA0	5.4	98-	164		52 114	10 03 27	2 11 19	D	1428SA5	3.5	87+	138		13 271
10 01 03	23 20 48	r	1458 K2	5.9	85-	135		40 120	10 03 29	2 37 1	D	1670 K4	4.8	98+	165		17 247
10 01 04	2 2 45	R	1468 M2	4.7s	85-	134		56 176	10 04 24	23 5 17	d	1605 K3	6.0	84+	132		31 232
10 01 06	5 52 11	R	1713cK0	5.6	63-	105	-8	35 217	10 05 20	12 37 49	d	1428SA5	3.5	45+	85	60	22 98
10 01 25	17 45 8	m	598SG0	5.5s	74+	118		67 137	10 06 23	20 10 0	d	2269cB5	5.4	93+	149	-8	19 165
10 01 28	18 50 43	D	1110SF0	3.5	97+	160		47 103	10 06 23	23 0 45	d	2286 B5	5.4v	93+	150		16 205
10 01 28	22 54 10	D	1129SF5	5.3	97+	161		66 212	10 06 28	23 47 31	R	2987SF3	4.9	94-	152		23 155
10 01 31	0 50 20	R	1409cK0	5.0	99-	169		57 204	10 07 07	3 3 6	R	399SA0	5.7	25-	60	-6	34 96
10 01 31	5 44 47	R	1428SA5	3.5	99-	166	-7	11 274	10 07 24	20 18 19	d	2822 A6	5.6	99+	167	-12	16 147
10 02 02	5 37 32	R	1670 K4	4.8	87-	138	-8	21 245	10 07 25	0 29 2	d	2838cK1	5.6	99+	168		18 207
10 02 07	2 59 59	r	2273 B8	5.9v	38-	76		12 141	10 08 06	1 5 23	R	767SB2	5.5	21-	55		12 68
10 02 16	16 45 8	d	3482cF6	5.7	6+	28	-2	25 248	10 08 27	0 23 51	R	3501 *5	5.0v	95-	155		48 170
10 02 20	23 5 7	d	54005DA2	5.6	38+	76		3 296	10 08 31	2 9 46	R	435 F5	5.8s	66-	109		58 133
10 02 20	23 5 9	D	440SA2	4.7	38+	76		3 296	10 09 18	17 34 3	d	2987SF3	4.9	82+	129	-2	18 143
10 02 21	19 18 44	D	545 B6	4.1v	47+	87		54 252	10 09 23	0 27 54	d	3482cF6	5.7	100+	174		42 213
10 02 21	19 26 30	R	545 B6	4.1v	47+	87		52 254	10 09 30	4 21 38	R	839 B2	5.4s	60-	102	-11	69 178
10 02 23	0 29 0	d	743SA0	5.8	60+	102		10 294	10 10 01	23 6 25	R	1113wM0	5.1s	41-	79		5 66
10 02 24	19 35 15	M	1050 K5	5.7	79+	126		71 176	10 10 02	1 11 12	R	1127cF2	5.9s	40-	78		25 86
10 02 25	19 46 6	D	1193cA0	5.4	88+	140		65 149	10 10 18	23 6 0	D	3320SK2	5.0	85+	134		27 231
10 02 27	21 4 26	d	1458 K2	5.9	99+	168		51 143	10 10 24	20 34 4	R	472cA1	4.9	97-	159		37 97
10 02 27	23 33 52	D	1468 M2	4.7s	99+	169</											

Data a m g	Ora h m s	P	StellaSp No D	Mag V	% ill	Elon Alt	Sole Alt	Luna Alt Az
10 12 23	6 5 40	R	1175cK5	4.9	96-	156	-9 23	273
10 12 25	2 23 38	R	1410WK3	5.1	82-	130	54	172
10 12 31	3 44 6	r	2134SK4	5.9	18-	51	4	126

#### Occultazioni per NAPOLI

10 01 01	21 49 48	R	1193cA0	5.4	98-	164	53 113	
10 01 03	23 22 57	r	1458 K2	5.9	85-	135	42 120	
10 01 04	2 4 22	R	1468 M2	4.7s	85-	134	57 178	
10 01 06	5 55 26	R	1713cK0	5.6	63-	105	-6 36	219
10 01 06	23 50 28	r	1800 A0	5.5	54-	95	8 110	
10 01 28	18 52 22	D	1110SF0	3.5	97+	160	48 102	
10 01 28	22 57 55	D	1129SF5	5.3	97+	161	67 217	
10 01 31	0 53 46	R	1409cK0	5.0	99-	169	58 208	
10 01 31	5 47 12	R	1428SA5	3.5	99-	166	-6 9	275
10 02 02	5 40 22	R	1670 K4	4.8	87-	138	-7 21	246
10 02 07	2 58 20	r	2273 B8	5.9v	38-	76	13 141	
10 02 16	16 48 58	D	3482cF6	5.7	6+	28	-3 25	250
10 02 20	23 5 31	d	440SA2	4.7	38+	76	2 297	
10 02 21	19 9 16	D	545 B6	4.1v	47+	87	55 253	
10 02 21	19 40 39	r	545 B6	4.1v	47+	87	49 260	
10 02 24	19 23 44	D	1050 K5	5.7	79+	126	72 169	
10 02 25	19 47 16	D	1193cA0	5.4	88+	140	66 149	
10 02 27	21 4 5	d	1458 K2	5.9	99+	168	53 143	
10 02 27	23 37 7	D	1468 M2	4.7s	99+	169	54 208	
10 03 09	5 22 4	D	2672wK1	2.8	35-	72	-1 22	165
10 03 09	6 33 22	R	2672wK1	2.8	35-	72	12 24	182
10 03 19	20 52 7	d	399SA0	5.7	15+	45	3 294	
10 03 22	18 28 26	D	822SB9	5.8	42+	81	61 246	
10 03 24	13 0 11	d	1110SF0	3.5	63+	105	43 22	80
10 03 26	21 23 1	D	1409cK0	5.0	86+	135	57 210	
10 03 27	2 17 39	D	1428SA5	3.5	87+	138	8 276	
10 03 29	2 48 53	d	1670 K4	4.8	98+	165	13 254	
10 04 24	23 19 5	d	1605 K3	6.0	84+	132	29 242	
10 05 20	12 39 0	d	1428SA5	3.5	45+	85	60 26	100
10 06 06	2 24 16	R	3501 *5	5.0v	39-	77	-11 30	114
10 06 23	20 17 42	D	2269cB5	5.4	93+	149	24 172	
10 06 23	23 14 22	d	2286 B5	5.4v	93+	150	17 213	
10 06 28	23 48 59	R	2987SF3	4.9	94-	152	29 159	
10 07 02	23 19 17	R	3453wA0	5.0v	65-	108	18 105	
10 07 07	3 16 32	r	399SA0	5.7	25-	60	-4 41	99
10 07 24	20 21 58	d	2822 A6	5.6	99+	167	22 152	
10 07 25	0 33 26	d	2838cK1	5.6	99+	168	20 213	
10 08 06	0 57 33	R	767SB2	5.5	21-	55	13 69	
10 08 27	0 36 28	R	3501 *5	5.0v	95-	155	53 183	
10 08 31	2 13 23	R	435 F5	5.8s	66-	109	65 137	
10 09 05	2 49 3	R	1186 K1	6.0	15-	46	22 83	
10 09 18	17 47 52	D	2987SF3	4.9	82+	130	-8 26	150
10 09 30	4 29 29	R	839 B2	5.4s	60-	102	-6 72	200
10 10 01	22 59 18	R	1113wM0	5.1s	41-	79	5 68	
10 10 02	1 4 50	R	1127cF2	5.9s	40-	78	27 86	
10 10 18	23 14 37	D	3320SK2	5.0	85+	134	26 239	
10 10 24	20 31 50	R	472cA1	4.9	97-	159	41 97	
10 10 27	20 22 31	R	916SG7	4.3s	77-	123	11 69	
10 10 27	22 52 28	R	929SB2	5.8v	76-	122	38 91	
10 10 28	6 10 31	M	976SM3	2.9v	74-	119	7 46	260
10 11 09	16 12 46	d	NGC6530 C	6.0	14+	44	-5 17	213
10 11 16	20 18 0	D	3501 *5	5.0v	78+	124	49 208	
10 11 23	0 51 18	r	742SG8	5.8	98-	164	69 220	
10 11 24	4 39 21	R	916SG7	4.3s	94-	150	40 267	
10 11 24	22 5 10	R	1047SA2	5.3	88-	140	41 96	
10 11 25	20 24 11	r	1175cK5	4.9	81-	128	11 75	
10 11 30	1 55 24	R	1670 K4	4.8	35-	73	20 112	
10 12 03	4 27 43	R	2051 A*	5.9v	8-	32	7 123	
10 12 21	18 0 15	R	976SM3	2.9v	100-	174	21 78	
10 12 23	6 13 58	r	1175cK5	4.9	96-	156	-3 17	280
10 12 25	2 33 38	R	1410WK3	5.1	82-	130	59 186	
10 12 31	3 42 39	R	2134SK4	5.9	18-	51	9 129	

#### Occultazioni per PALERMO

10 01 01	21 46 16	R	1193cA0	5.4	98-	164	53 108	
10 01 03	23 23 40	r	1458 K2	5.9	85-	135	43 117	
10 01 04	2 0 29	R	1468 M2	4.7s	85-	134	60 174	
10 01 06	5 57 23	R	1713cK0	5.6	63-	105	-5 38	220
10 01 06	23 53 52	r	1800 A0	5.5	54-	95	9 110	
10 01 28	18 53 21	D	1110SF0	3.5	97+	160	48 99	
10 01 28	23 2 31	D	1129SF5	5.3	97+	161	69 222	
10 01 31	0 56 42	R	1409cK0	5.0	99-	169	60 210	
10 01 31	5 51 28	R	1428SA5	3.5	99-	166	-5 9	275
10 02 02	5 43 2	R	1670 K4	4.8	87-	138	-6 22	247
10 02 07	2 47 35	r	2273 B8	5.9v	38-	76	13 138	
10 02 16	16 55 0	D	3482cF6	5.7	6+	28	-3 25	252
10 02 21	18 59 9	D	545 B6	4.1v	47+	87	59 253	
10 02 21	19 51 37	r	545 B6	4.1v	47+	87	48 264	
10 02 21	20 49 53	D	560cB8	3.6s	48+	87	38 273	
10 02 21	21 1 58	R	560cB8	3.6s	48+	87	35 275	
10 02 24	19 11 33	D	1050 K5	5.7	79+	126	74 154	
10 02 25	19 45 44	D	1193cA0	5.4	88+	140	68 143	

Data a m g	Ora h m s	P	StellaSp No D	Mag V	% ill	Elon Alt	Sole Alt	Luna Alt Az
10 02 27	20 59 36	d	1458 K2	5.9	99+	168	54 138	
10 02 27	23 40 11	D	1468 M2	4.7s	99+	169	57 210	
10 03 08	5 19 25	r	2524SB9	6.0	44-	83	-3 26	176
10 03 09	5 20 49	D	2672wK1	2.8	35-	72	-2 25	163
10 03 09	6 28 18	R	2672wK1	2.8	35-	72	11 27	180
10 03 19	20 55 4	d	399SA0	5.7	15+	45	2 294	
10 03 22	18 27 13	D	822SB9	5.8	42+	81	63 250	
10 03 24	12 50 13	d	1110SF0	3.5	63+	105	47 19	77
10 03 26	21 18 42	D	1409cK0	5.0	86+	135	60 209	
10 03 27	2 20 34	D	1428SA5	3.5	87+	138	8 276	
10 03 29	2 54 52	d	1670 K4	4.8	98+	165	13 255	
10 04 29	23 14 14	r	2237 K3	5.0s	97-	161	26 164	
10 05 16	9 1 28	M	Venus	-4.0	7+	30	58 36	85
10 05 20	12 38 42	d	1428SA5	3.5	45+	85	62 26	98
10 06 06	2 22 1	R	3501 *5	5.0v	39-	77	30 112	
10 06 23	20 14 14	D	2269cB5	5.4	93+	149	27 170	
10 06 23	23 16 27	d	2286 B5	5.4v	93+	150	19 213	
10 06 28	23 42 54	R	2987SF3	4.9	94-	152	31 156	
10 07 02	23 17 45	R	3453wA0	5.0v	65-	108	18 103	
10 07 07	3 13 32	R	399SA0	5.7	25-	60	-7 40	95
10 07 24	0 48 30	d	2692 K3	5.5	96+	157	13 225	
10 07 24	20 17 40	d	2822 A6	5.6	99+	167	23 150	
10 07 25	0 32 31	d	2838cK1	5.6	99+	168	23 213	
10 08 06	0 53 37	R	767SB2	5.5	21-	55	10 67	
10 08 27	0 33 3	R	3501 *5	5.0v	95-	155	55 180	
10 08 31	2 7 46	R	435 F5	5.8s	66-	109	65 129	
10 09 05	2 50 9	R	1186 K1	6.0	15-	46	21 81	
10 09 18	17 53 57	M	2987SF3	4.9	82+	130	-9 28	149
10 09 30	4 23 58	R	839 B2	5.4s	61-	102	-8 75	195
10 10 01	22 55 44	r	1113wM0	5.1s	41-	79	3 66	
10 10 02	0 58 21	R	1127cF2	5.9s	40-	78	25 83	
10 10 18	23 16 45	D	3320SK2	5.0	85+	134	27 240	
10 10 24	20 26 39	R	472cA1	4.9	97-	159	39 93	
10 10 27	20 20 21	R	916SG7	4.3s	77-	123	9 68	
10 10 27	22 46 14	R	929SB2	5.8v	76-	122	36 87	
10 11 16	20 24 23	D	3501 *5	5.0v	78+	124	52 211	
10 11 23	0 50 44	r	742SG8	5.8	98-	164	72 223	
10 11 24	4 44 23	R	916SG7	4.3s	93-	150	40 270	
10 11 24	22 1 39	R	1047SA2	5.3	88-	140	40 92	
10 11 30	1 44 50	R	1670 K4	4.8	36-	73	18 109	
10 12 03	4 28 3	R	2051 A*	5.9v	8-	32	8 122	
10 12 21	17 55 31	R	976SM3	2.9v	100-	174	19 76	
10 12 23	6 19 6	r	1175cK5	4.9	96-	156	-1 17	281
10 12 25	2 29 10	R	1410WK3	5.1	82-	131	62 182	
10 12 31	3 37 41	R	2134SK4	5.9	18-	51	10 127	

#### Occultazioni per PERUGIA

10	01	01	21	48	24	R	1193cA0	5.4	98-	164	51	114
10	01	03	23	19	10	r	1458 K2	5.9	85-	135	39	119
10	01	04	2	0	41	R	1468 M2	4.7s	85-	134	55	173
10	01	06	5	49	39	R	1713cK0	5.6	63-	105	-9	36 215
10	01	25	17	38	28	D	598SG0	5.5s	74+	118	65	133
10	01	28	18	49	26	D	1110SF0	3.5	97+	160	45	103
10	01	28	22	51	35	D	1129SF5	5.3	97+	161	66	207
10	01	31	0	47	57	R	1409cK0	5.0	99-	169	57	201
10	01	31	5	43	34	R	1428SA5	3.5	99-	166	-8	12 273
10	02	02	5	35	32	R	1670 K4	4.8	87-	138	-9	22 243
10	02	07	2	59	37	r	2273 B8	5.9v	38-	76	11	140
10	02	16	16	42	51	d	3482cF6	5.7	6+	28	-1	26 246
10	02	20	23	4	54	d X	5400SDA2	5.6	38+	76	4	295
10	02	20	23	4	56	D	440SA2	4.7	38+	76	4	295
10	02	21	19	20	57	M	545 B6	4.1v	47+	87	54	251
10	02	23	0	28	23	d	743SA0	5.8	60+	102	12	294
10	02	24	19	33	16	M	1050 K5	5.7	79+	126	70	172
10	02	25	19	44	33	D	1193cA0	5.4	88+	140	64	147
10	02	27	21	3	30	d	1458 K2	5.9	99+	168	50	142
10	02	27	23	31	31	D	1468 M2	4.7s	99+	169	53	201
10	03	08	5	16	30	r	2524SB9	6.0	44-	83	-4	21 174
10	03	09	5	18	8	D	2672wK1	2.8	35-	72	-4	20 162
10	03	09	6	32	10	R	2672wK1	2.8	35-	72	10	22 180
10	03	19	20	50	29	D	399SA0	5.7	15+	45	5	292
10	03	22	18	25	14	D	822SB9	5.8	42+	81	-12	62 239
10	03	26	21	20	3	D	1409cK0	5.0	86+	135	56	204
10	03	27	2	14	52	D	1428SA5	3.5	87+	138	10	274
10	03	29	2	43	17	d	1670 K4	4.8	98+	165	14	252
10	04	24	23	12	8	d	1605 K3	6.0	84+	132	30	238
10	05	20	12	38	16	d	1428SA5	3.5	45+	85	60	25 100
10	06	06	2	12	30	G	3501 *5	5.0v	39-	77	26	111
10	06	23	20	14	57	d	2269cB5	5.4	93+	149	22	170
10	06	23	23	8	30	d	2286 B5	5.4v	93+	150	16	210
10	06	28	23	49	21	R	2987SF3	4.9	94-	152	26	158
10	07	02	23	10	3	g	3453wA0	5.0v	65-	108	15	102
10	07	07	3	13	51	R	399SA0	5.7	25-	60	-5	39 99
10	07	24	20	20	53	d	2822 A6	5.6	99+	167	19	150
10	07	25	0	31	31	d	2838cK1	5.6	99+	168	19	211
10	08	06	1	1	26	R	767SB2	5.5	21-	55	13	69
10	08	27	0	32	33	R	3501 *5	5.0v	95-	155	51	178
10	08	31	2	13	3	R	435 F5	5.8s	66-	109	62	137
10	09	05	2	44	13	R	1186 K1	6.0	15-	46	20	82
10	09	18	17	40	24	D	2987SF3	4.9	82+	129	-5	22 146

Data a m g	Ora h m s	P	StellaSp No D	Mag V	% ill	Elon Alt	Sole Alt	Luna Alt Az	Data a m g	Ora h m s	P	StellaSp No D	Mag V	% ill	Elon Alt	Sole Alt	Luna Alt Az
10 09 23	0 42 20	d	3482cF6	5.7	100+	174		41 222	10 01 06	5 51 13	R	1713cK0	5.6	63-	105	-9 36	216
10 09 30	4 27 4	R	839 B2	5.4s	60-	102	-8 71	191	10 01 25	17 42 51	m	598SG0	5.5s	74+	118		67 134
10 10 01	23 2 51	R	1113wM0	5.1s	41-	79		5 67	10 01 28	18 49 35	D	1110SF0	3.5	97+	160		46 101
10 10 02	1 8 31	R	1127cF2	5.9s	40-	78		27 87	10 01 28	22 53 43	D	1129SF5	5.3	97+	161		67 210
10 10 18	23 10 31	D	3320SK2	5.0	85+	134		26 235	10 01 31	0 49 54	R	1409cK0	5.0	99-	169		58 202
10 10 24	20 33 39	R	472cA1	4.9	97-	159		40 98	10 01 31	5 45 30	R	1428SA5	3.5	99-	166	-8 11	273
10 10 27	20 23 56	R	916SG7	4.3s	77-	123		11 68	10 02 02	5 37 15	R	1670 K4	4.8	87-	138	-9 22	244
10 10 27	22 55 28	R	929SB2	5.8v	76-	122		37 92	10 02 07	2 56 58	r	2273 B8	5.9v	38-	76		11 139
10 10 28	5 58 28	D	976SM3	2.9v	74-	119	2 49	254	10 02 16	16 44 46	d	3482cF6	5.7	6+	28	-1 26	247
10 10 28	6 11 0	R	976SM3	2.9v	74-	119	5 47	257	10 02 20	23 5 12	d X	54005DA2	5.6	38+	76		4 295
10 11 16	20 8 48	D	3501 *5	5.0v	78+	124	49	201	10 02 20	23 5 14	D	440SA2	4.7	38+	76		4 295
10 11 23	0 45 57	r	742SG8	5.8	98-	164	69	209	10 02 21	19 11 13	D	545 B6	4.1v	47+	87		56 250
10 11 24	4 33 29	R	916SG7	4.3s	94-	150	43	263	10 02 21	19 32 24	r	545 B6	4.1v	47+	87		52 255
10 11 24	22 4 40	R	1047SA2	5.3	88-	140	39	96	10 02 23	0 29 20	d	743SA0	5.8	60+	102		11 294
10 11 25	20 35 6	r	1175cK5	4.9	81-	128	12	76	10 02 24	19 25 52	D	1050 K5	5.7	79+	126		71 166
10 11 30	1 58 26	R	1670 K4	4.8	35-	73	18	112	10 02 25	19 44 8	D	1193cA0	5.4	88+	140		65 145
10 12 03	4 26 47	R	2051 A*	5.9v	8-	32	5	121	10 02 27	21 1 43	d	1458 K2	5.9	99+	168		51 141
10 12 21	18 3 49	R	976SM3	2.9v	100-	174	20	78	10 02 27	23 33 13	D	1468 M2	4.7s	99+	169		54 203
10 12 23	6 9 57	R	1175cK5	4.9	96-	156	-5 20	277	10 03 08	5 16 49	r	2524SB9	6.0	44-	83	-4 22	175
10 12 25	2 29 49	R	1410WK3	5.1	82-	130	57	180	10 03 09	5 18 9	D	2672wK1	2.8	35-	72	-4 21	162
10 12 31	3 43 46	R	2134SK4	5.9	18-	51	7	128	10 03 09	6 31 11	R	2672wK1	2.8	35-	72	10 23	180
Occultazioni per POTENZA									10 03 19	20 51 33	D	399SA0	5.7	15+	45		5 293
10 01 01	21 52 0	R	1193cA0	5.4	98-	164		54 115	10 03 22	18 25 2	D	822SB9	5.8	42+	81		62 241
10 01 03	23 24 45	r	1458 K2	5.9	85-	135		43 122	10 03 26	21 18 32	D	1409cK0	5.0	86+	135		57 205
10 01 04	2 7 57	R	1468 M2	4.7s	85-	134		57 182	10 03 27	2 16 13	D	1428SA5	3.5	87+	138		10 274
10 01 06	5 58 9	R	1713cK0	5.6	63-	105	-5 35	222	10 03 29	2 45 53	d	1670 K4	4.8	98+	165		14 252
10 01 06	23 50 31	r	1800 A0	5.5	54-	95		10 111	10 04 24	23 15 47	d	1605 K3	6.0	84+	132		30 239
10 01 28	18 54 35	D	1110SF0	3.5	97+	160		49 104	10 05 20	12 37 55	d	1428SA5	3.5	45+	85	61 25	99
10 01 28	23 0 19	D	1129SF5	5.3	97+	161		66 222	10 06 06	2 19 8	R	3501 *5	5.0v	39-	77		28 112
10 01 31	0 55 57	R	1409cK0	5.0	99-	169		57 212	10 06 23	20 14 20	d	2269cB5	5.4	93+	149		23 169
10 01 31	5 47 28	R	1428SA5	3.5	99-	166	-4 8	276	10 06 23	23 10 0	d	2286 B5	5.4v	93+	150		17 210
10 02 02	5 42 1	R	1670 K4	4.8	87-	138	-5 20	248	10 06 28	23 47 41	R	2987SF3	4.9	94-	152		27 157
10 02 07	3 1 18	r	2273 B8	5.9v	38-	76	14	143	10 07 02	23 16 7	R	3453wA0	5.0v	65-	108		16 103
10 02 16	16 51 8	D	3482cF6	5.7	6+	28	-4 23	252	10 07 07	3 13 56	R	399SA0	5.7	25-	60	-5 39	98
10 02 21	19 11 48	D	545 B6	4.1v	47+	87		54 255	10 07 24	20 19 43	d	2822 A6	5.6	99+	167		20 150
10 02 21	19 42 31	r	545 B6	4.1v	47+	87		48 261	10 07 25	0 31 27	d	2838cK1	5.6	99+	168		20 211
10 02 24	19 27 19	D	1050 K5	5.7	79+	126		73 177	10 08 06	0 59 40	R	767SB2	5.5	21-	55		12 68
10 02 25	19 50 13	D	1193cA0	5.4	88+	140		67 154	10 08 27	0 32 31	R	3501 *5	5.0v	95-	155		52 178
10 02 27	21 7 20	d	1458 K2	5.9	99+	168		54 147	10 08 31	2 11 44	R	435 F5	5.8s	66-	109		63 135
10 02 27	23 39 27	D	1468 M2	4.7s	99+	169		54 211	10 09 05	2 46 12	R	1186 K1	6.0	15-	46		20 82
10 03 09	5 25 37	d	2672wK1	2.8	35-	72	1	23 167	10 09 18	17 41 13	D	2987SF3	4.9	82+	129	-6 23	146
10 03 09	6 35 47	R	2672wK1	2.8	35-	72	14	24 184	10 09 23	0 48 25	d	3482cF6	5.7	100+	174		41 225
10 03 22	18 31 23	D	822SB9	5.8	42+	81		60 249	10 09 30	4 26 25	R	839 B2	5.4s	60-	102	-8 72	191
10 03 24	12 57 54	d	1110SF0	3.5	63+	105	43	23 80	10 10 01	23 1 20	R	1113wM0	5.1s	41-	79		5 67
10 03 26	21 28 0	D	1409cK0	5.0	86+	135		56 215	10 10 02	1 6 21	R	1127cF2	5.9s	40-	78		26 86
10 03 27	2 18 2	D	1428SA5	3.5	87+	138		7 277	10 10 18	23 11 30	D	3320SK2	5.0	85+	134		27 236
10 03 29	2 49 54	d	1670 K4	4.8	98+	165		12 256	10 10 24	20 31 58	R	472cA1	4.9	97-	159		39 96
10 04 24	23 19 36	d	1605 K3	6.0	84+	132		27 244	10 10 27	20 23 11	R	916SG7	4.3s	77-	123		10 68
10 05 20	12 40 9	d	1428SA5	3.5	45+	85	59	28 101	10 10 27	22 53 28	R	929SB2	5.8v	76-	122		37 91
10 06 06	2 27 59	R	3501 *5	5.0v	39-	77	-10 32	116	10 10 28	6 6 50	M	976SM3	2.9v	74-	119	4 48	257
10 06 23	20 21 6	D	2269cB5	5.4	93+	149		25 174	10 11 16	20 10 20	D	3501 *5	5.0v	78+	124		50 202
10 06 23	23 17 15	d	2286 B5	5.4v	93+	150		16 215	10 11 23	0 47 2	r	742SG8	5.8	98-	164		70 212
10 06 28	23 51 16	R	2987SF3	4.9	94-	152		30 162	10 11 24	4 36 10	R	916SG7	4.3s	94-	150		42 265
10 07 02	23 21 22	R	3453wA0	5.0v	65-	108		20 106	10 11 24	22 3 59	R	1047SA2	5.3	88-	140		39 95
10 07 07	3 18 55	r	399SA0	5.7	25-	60	-3 43	100	10 11 25	20 31 3	r	1175cK5	4.9	81-	128		11 75
10 07 24	20 24 46	d	2822 A6	5.6	99+	167		23 154	10 11 30	1 56 2	R	1670 K4	4.8	35-	73		18 111
10 07 25	0 35 11	d	2838cK1	5.6	99+	168		20 215	10 12 03	4 27 16	R	2051 A*	5.9v	8-	32		6 121
10 08 06	0 56 43	R	767SB2	5.5	21-	55		13 69	10 12 21	18 1 58	R	976SM3	2.9v	100-	174		20 77
10 08 27	0 39 58	R	3501 *5	5.0v	95-	155		53 187	10 12 23	6 12 15	R	1175cK5	4.9	96-	156	-4 19	278
10 08 31	2 15 48	R	435 F5	5.8s	66-	109		66 141	10 12 25	2 29 39	R	1410WK3	5.1	82-	130		58 180
10 09 05	2 50 35	R	1186 K1	6.0	15-	46		23 84	10 12 31	3 42 17	R	2134SK4	5.9	18-	51		8 128
10 09 18	17 54 36	D	2987SF3	4.9	82+	130	-11 27	153	Occultazioni per TORINO								
10 09 30	4 32 43	R	839 B2	5.4s	60-	102	-4 72	207	10 01 01	21 43 14	R	1193cA0	5.4	98-	164		46 110
10 10 01	22 58 25	R	1113wM0	5.1s	41-	79		6 68	10 01 03	23 13 22	r	1458 K2	5.9	85-	135		34 114
10 10 02	1 4 48	R	1127cF2	5.9s	40-	78		28 87	10 01 04	1 51 39	R	1468 M2	4.7s	85-	134		52 162
10 10 18	23 16 47	D	3320SK2	5.0	85+	134		24 241	10 01 06	5 39 54	R	1713cK0	5.6	63-	105		36 206
10 10 24	20 32 49	R	472cA1	4.9	97-	159		42 98	10 01 25	17 16 15	D	598SG0	5.5s	74+	118	-9 58	121
10 10 27	20 22 24	R	916SG7	4.3s	77-	123		12 70	10 01 27	17 20 56	d	936cK0	5.8	91+	145	-9 39	93
10 10 27	22 53 0	R	929SB2	5.8v	76-	122		39 92	10 01 28	18 44 44	D	1110SF0	3.5	97+	160		41 100
10 10 28	6 12 23	M	976SM3	2.9v	74-	119	8 45	262	10 01 28	22 42 16	D	1129SF5	5.3	97+	161		66 190
10 11 09	16 14 47	d	NGC6530 C	6.0	14+	44	-6 17	215	10 01 31	0 39 30	R	1409cK0	5.0	99-	169		56 188
10 11 16	20 24 8	D	3501 *5	5.0v	78+	124		48 213	10 01 31	5 39 58	R	1428SA5	3.5	99-	166		16 268
10 11 23	0 54 28	r	742SG8	5.8	98-	164		68 225	10 02 02	5 28 1	R	1670 K4	4.8	87-	138		25 237
10 11 24	4 40 27	R	916SG7	4.3s	94-	150		39 269	10 02 07	2 55 23	r	2273 B8	5.9v	38-	76		6 136
10 11 24	22 6 44	R															

Data a m g	Ora h m s	P	StellaSp No D	Mag V	% ill	Elon Alt	Sole Alt	Luna Alt Az	Data a m g	Ora h m s	P	StellaSp No D	Mag V	% ill	Elon Alt	Sole Alt	Luna Alt Az
10 05 20 12 36 41 d			1428SA5	3.5	45+	85	61 21	97	10 11 24 22 4 39 R			1047SA2	5.3	88-	140	38 98	
10 06 23 20 6 43 d			2269cB5	5.4	93+	149	-7 19	163	10 11 25 20 43 26 R			1175cK5	4.9	81-	128	13 77	
10 06 23 22 58 35 d			2286 B5	5.4v	93+	150	17 20	203	10 11 30 2 2 26 R			1670 K4	4.8	35-	73	17 113	
10 06 28 23 44 36 R			2987SF3	4.9	94-	152	23 152		10 12 03 4 25 28 r			2051 A*	5.9v	8-	32	2 120	
10 07 07 2 57 15 M			399SA0	5.7	25-	60	-8 32	93	10 12 13 17 36 44 D			3453wA0	5.0v	51+	91	45 188	
10 07 24 20 15 29 d			2822 A6	5.6	99+	167	-11 15	145	10 12 21 18 7 52 R			976SM3	2.9v	100-	174	21 79	
10 07 25 0 27 38 d			2838cK1	5.6	99+	168	19 205		10 12 23 6 4 12 R			1175cK5	4.9	96-	156	-8 22 274	
10 08 06 1 5 13 R			767SB2	5.5	21-	55	11 67		10 12 25 2 27 26 R			1410WK3	5.1	82-	130	54 177	
10 08 27 0 19 41 R			3501 *5	5.0v	95-	155	48 166		10 12 31 3 46 14 R			2134SK4	5.9	18-	51	5 128	
10 08 31 2 6 48 R			435 F5	5.8s	66-	109	57 130		Occultazioni per TRIESTE								
10 09 23 0 24 56 d			3482cF6	5.7	100+	174	43 210		10 01 01 21 50 55 R			1193cA0	5.4	98-	164	51 119	
10 09 30 4 18 38 R			839 B2	5.4s	60-	102	69 173		10 01 03 23 17 20 r			1458 K2	5.9	85-	135	38 121	
10 10 01 23 6 25 r			1113wM0	5.1s	41-	79	4 65		10 01 04 2 3 10 R			1468 M2	4.7s	85-	134	52 177	
10 10 02 1 10 9 R			1127cF2	5.9s	40-	78	24 85		10 01 06 5 48 19 R			1713cK0	5.6	63-	105	-10 33 215	
10 10 18 23 4 29 D			3320SK2	5.0	85+	134	28 229		10 01 20 15 50 33 d			3501 *5	5.0v	23+	58	0 46 201	
10 10 24 20 32 16 R			472cA1	4.9	97-	159	36 95		10 01 25 17 30 12 D			598SG0	5.5s	74+	118	63 136	
10 10 27 20 24 29 R			916SG7	4.3s	77-	123	9 66		10 01 27 17 31 53 d			936cK0	5.8	91+	145	45 101	
10 10 27 22 55 34 R			929SB2	5.8v	76-	122	34 90		10 01 28 18 51 35 D			1110SF0	3.5	97+	160	46 107	
10 10 28 5 51 5 D			976SM3	2.9v	74-	119	-3 53 245		10 01 28 22 49 54 D			1129SF5	5.3	97+	161	64 207	
10 10 28 6 0 44 R			976SM3	2.9v	74-	119	-1 51 247		10 01 31 0 45 15 R			1409cK0	5.0	99-	169	54 201	
10 11 03 4 17 11 M			1713cK0	5.6	12-	41	14 113		10 01 31 5 39 13 R			1428SA5	3.5	99-	166	-9 12 272	
10 11 16 19 56 53 D			3501 *5	5.0v	78+	124	48 189		10 02 02 5 33 2 R			1670 K4	4.8	87-	138	-9 20 243	
10 11 21 5 6 26 d			472cA1	4.9	100+	172	11 289		10 02 07 3 7 4 r			2273 B8	5.9v	38-	76	10 143	
10 11 23 0 35 17 r			742SG8	5.8	98-	164	69 190		10 02 16 16 40 48 d			3482cF6	5.7	6+	28	-2 25 246	
10 11 24 4 26 22 R			916SG7	4.3s	94-	150	47 256		10 02 20 23 4 37 d X			54005DA2	5.6	38+	76	5 296	
10 11 24 22 0 54 R			1047SA2	5.3	88-	140	35 94		10 02 20 23 4 39 D			440SA2	4.7	38+	76	5 296	
10 11 25 20 42 20 r			1175cK5	4.9	81-	128	10 74		10 02 21 20 7 59 D			556cB8	5.4	47+	87	44 259	
10 11 30 1 58 24 R			1670 K4	4.8	35-	73	14 109		10 02 23 0 26 32 d			743SA0	5.8	60+	102	12 294	
10 12 07 16 44 15 m			2706 B8	5.8	4+	23	-10 5 229		10 02 25 19 49 1 D			1193cA0	5.4	88+	140	62 154	
10 12 13 17 24 58 D			3453wA0	5.0v	51+	91	46 179		10 02 27 21 13 44 d			1458 K2	5.9	99+	168	50 149	
10 12 21 18 6 11 R			976SM3	2.9v	100-	174	18 76		10 02 27 23 30 13 D			1468 M2	4.7s	99+	169	51 202	
10 12 23 6 6 33 R			1175cK5	4.9	96-	156	-10 24 273		10 03 02 0 47 27 r			1713cK0	5.6	97-	160	39 190	
10 12 25 2 20 23 R			1410WK3	5.1	82-	130	54 168		10 03 09 5 21 13 D			2672wK1	2.8	35-	72	-2 18 165	
10 12 31 3 42 31 r			2134SK4	5.9	18-	51	3 125		10 03 09 6 36 25 r			2672wK1	2.8	35-	72	11 19 182	
Occultazioni per TRENTO									10 03 19 20 48 11 D			399SA0	5.7	15+	45	6 293	
10 01 01 21 47 40 R			1193cA0	5.4	98-	164	48 115		10 03 22 18 29 32 D			822SB9	5.8	42+	81	59 239	
10 01 03 23 14 49 r			1458 K2	5.9	85-	135	36 118		10 03 26 21 33 28 M			1409cK0	5.0	86+	136	52 210	
10 01 04 1 58 20 R			1468 M2	4.7s	85-	134	52 170		10 03 27 2 12 11 D			1428SA5	3.5	87+	138	10 274	
10 01 06 5 44 5 R			1713cK0	5.6	63-	105	34 211		10 03 29 2 38 33 d			1670 K4	4.8	98+	165	14 251	
10 01 25 17 22 57 D			598SG0	5.5s	74+	118	60 129		10 04 24 23 5 22 d			1605 K3	6.0	84+	132	29 236	
10 01 27 17 25 2 d			936cK0	5.8	91+	145	42 98		10 05 20 12 40 47 d			1428SA5	3.5	45+	85	57 25 102	
10 01 28 18 48 48 D			1110SF0	3.5	97+	160	44 104		10 06 06 2 18 38 M			3501 *5	5.0v	39-	77	-9 27 115	
10 01 28 22 45 47 D			1129SF5	5.3	97+	161	64 199		10 06 23 20 19 31 d			2269cB5	5.4	93+	149	-11 20 172	
10 01 31 0 41 54 R			1409cK0	5.0	99-	169	54 195		10 06 23 23 7 50 d			2286 B5	5.4v	93+	150	14 211	
10 01 31 5 38 29 R			1428SA5	3.5	99-	166	-11 14 270		10 06 28 23 55 4 R			2987SF3	4.9	94-	152	25 161	
10 02 02 5 30 6 R			1670 K4	4.8	87-	138	-12 22 240		10 07 02 23 15 49 m			3453wA0	5.0v	65-	108	16 105	
10 02 07 3 3 24 r			2273 B8	5.9v	38-	76	8 140		10 07 07 3 16 9 r			399SA0	5.7	25-	60	-2 40 102	
10 02 20 23 4 11 d X			54005DA2	5.6	38+	76	7 294		10 07 24 20 26 1 d			2822 A6	5.6	99+	167	18 153	
10 02 20 23 4 13 D			440SA2	4.7	38+	76	7 294		10 07 25 0 33 0 d			2838cK1	5.6	99+	168	16 212	
10 02 21 20 5 13 D			556cB8	5.4	47+	87	46 255		10 08 06 1 4 46 R			767SB2	5.5	21-	55	15 71	
10 02 23 0 25 56 d			743SA0	5.8	60+	102	14 292		10 08 27 0 35 41 R			3501 *5	5.0v	95-	155	48 182	
10 02 25 19 44 36 D			1193cA0	5.4	88+	140	61 147		10 08 31 2 17 59 R			435 F5	5.8s	66-	109	61 144	
10 02 27 21 7 48 d			1458 K2	5.9	99+	168	48 144		10 09 18 17 43 5 D			2987SF3	4.9	82+	129	-6 21 149	
10 02 27 23 26 11 D			1468 M2	4.7s	99+	169	51 196		10 09 23 0 38 15 d			3482cF6	5.7	100+	174	39 221	
10 03 02 0 39 14 r			1713cK0	5.6	97-	160	39 183		10 09 30 4 30 15 R			839 B2	5.4s	60-	102	-6 68 195	
10 03 08 5 13 38 r			2524SB9	6.0	44-	83	-6 17 173		10 10 01 23 5 34 R			1113wM0	5.1s	41-	79	8 69	
10 03 09 5 16 25 D			2672wK1	2.8	35-	72	-5 16 161		10 10 02 1 13 20 R			1127cF2	5.9s	40-	78	29 90	
10 03 09 6 32 13 r			2672wK1	2.8	34-	72	8 19 179		10 10 18 23 10 29 D			3320SK2	5.0	85+	134	24 236	
10 03 19 20 48 4 D			399SA0	5.7	15+	45	8 291		10 10 24 20 38 33 R			472cA1	4.9	97-	159	41 102	
10 03 22 18 24 44 D			822SB9	5.8	42+	81	-10 61 233		10 10 27 20 25 42 R			916SG7	4.3s	77-	123	13 70	
10 03 26 21 24 43 D			1409cK0	5.0	86+	135	53 202		10 10 27 23 0 35 R			929SB2	5.8v	76-	122	39 96	
10 03 26 21 34 44 R			1409cK0	5.0	86+	136	53 206		10 10 28 5 42 44 d			976SM3	2.9v	74-	119	0 50 248	
10 03 27 2 11 8 D			1428SA5	3.5	87+	138	12 272		10 10 28 6 20 27 R			976SM3	2.9v	74-	119	6 44 257	
10 03 29 2 36 37 D			1670 K4	4.8	98+	165	15 249		10 11 03 4 32 48 R			1713cK0	5.6	12-	41	20 121	
10 04 24 23 3 44 d			1605 K3	6.0	84+	132	30 233		10 11 09 16 10 36 d			NGC6530 C	6.0	14+	44	-6 14 211	
10 05 20 12 39 26 d			1428SA5	3.5	45+	85	58 23 100		10 11 16 20 10 1 D			3501 *5	5.0v	78+	124	46 202	
10 06 23 20 14 25 d			2269cB5	5.4	93+	149	-9 19 168		10 11 23 0 45 28 r			742SG8	5.8	98-	164	66 209	
10 06 23 23 3 17 d			2286 B5	5.4v	93+	150	14 207		10 11 24 4 27 40 R			916SG7	4.3s	94-	150	42 261	
10 06 28 23 51 23 R			2987SF3	4.9	94-	152	23 158		10 11 24 22 7 19 R			1047SA2	5.3	88-	140	40 100	
10 07 07 3 8 59 r			399SA0	5.7	25-	60	-4 37 99		10 11 25 20 41 40 R			1175cK5	4.9	81-	128	15 78	
10 07 24 20 22 8 d			2822 A6	5.6	99+	167	16 150		10 11 30 2 3 54 R			1670 K4	4.8	35-	73	19 115	
10 07 25 0 30 52 d			2838cK1	5.6	99+	168	17 209		10 12 03 4 25 14 R			2051 A*	5.9v	8-	32	4 122	
10 08 06 1 5 48 R			767SB2	5.5	21-	55	14 69		10 12 13 17 53 17 M			3453wA0	5.0v	51+	91	44 198	
10 08 27 0 28 51 R			3501 *5	5.0v	95-	155	47 175		10 12 21 18 7 44 R			976SM3	2.9v	100-	174	23 80	
10 08 31 2 13 39 R			435 F5	5.8s	66-	109	59 139		10 12 23 6 4 37 R			1175cK5	4.9	96-	156	-7 20 276	
10 09 18 17 37 47 D			2987SF3	4.9	82+	129	-4 19 145		10 12 25 2 32 27 R			1410WK3	5.1	82-	130	54 184	



Data a m g	Ora h m s	P	StellaSp No D	Mag V	% Elon ill	Sole Alt	Luna Alt Az	Data a m g	Ora h m s	P	StellaSp No D	Mag V	% Elon ill	Sole Alt	Luna Alt Az
10 01 31	0 44 9	R	1409cK0	5.0	99-	169	55 198	10 08 06	1 4 44	R	767SB2	5.5	21-	55	14 70
10 01 31	5 39 34	R	1428SA5	3.5	99-	166	-10 12 271	10 08 27	0 32 11	R	3501 *5	5.0v	95-	155	48 178
10 02 02	5 32 7	R	1670 K4	4.8	87-	138	-11 21 241	10 08 31	2 15 17	R	435 F5	5.8s	66-	109	61 141
10 02 07	3 4 17	r	2273 B8	5.9v	38-	76	9 141	10 09 18	17 40 6	D	2987SF3	4.9	82+	129	-5 20 147
10 02 16	16 39 39	d	3482cF6	5.7	6+	28	-1 26 245	10 09 23	0 35 21	d	3482cF6	5.7	100+	174	40 219
10 02 20	23 4 27	d X	54005DA2	5.6	38+	76	6 295	10 09 30	4 27 36	R	839 B2	5.4s	60-	102	-8 68 190
10 02 20	23 4 28	D	440SA2	4.7	38+	76	6 295	10 10 01	23 5 38	R	1113wM0	5.1s	41-	79	7 68
10 02 21	20 10 34	d	556cB8	5.4	47+	87	45 258	10 10 02	1 12 23	R	1127cF2	5.9s	40-	78	28 88
10 02 23	0 26 33	d	743SA0	5.8	60+	102	13 293	10 10 18	23 9 12	D	3320SK2	5.0	85+	134	25 234
10 02 25	19 46 11	D	1193cA0	5.4	88+	140	62 150	10 10 24	20 36 55	R	472cA1	4.9	97-	159	40 100
10 02 27	21 8 58	d	1458 K2	5.9	99+	168	49 145	10 10 27	20 25 20	R	916SG7	4.3s	77-	123	12 69
10 02 27	23 28 30	D	1468 M2	4.7s	99+	169	51 199	10 10 27	22 59 13	R	929SB2	5.8v	76-	122	37 94
10 03 02	0 42 32	r	1713cK0	5.6	97-	160	39 186	10 10 28	5 43 33	D	976SM3	2.9v	74-	119	-1 51 247
10 03 08	5 16 3	r	2524SB9	6.0	44-	83	-4 18 174	10 10 28	6 17 17	R	976SM3	2.9v	74-	119	5 45 255
10 03 09	5 18 29	D	2672wK1	2.8	35-	72	-4 17 163	10 11 03	4 28 38	R	1713cK0	5.6	12-	41	19 119
10 03 09	6 33 53	R	2672wK1	2.8	34-	72	9 19 180	10 11 16	20 7 2	D	3501 *5	5.0v	78+	124	47 199
10 03 19	20 48 28	D	399SA0	5.7	15+	45	7 292	10 11 23	0 43 16	r	742SG8	5.8	98-	164	67 205
10 03 22	18 26 34	D	822SB9	5.8	42+	81	-11 60 236	10 11 24	4 27 46	R	916SG7	4.3s	94-	150	43 260
10 03 26	21 31 58	G	1409cK0	5.0	86+	136	53 208	10 11 24	22 5 42	R	1047SA2	5.3	88-	140	39 98
10 03 27	2 12 10	D	1428SA5	3.5	87+	138	11 273	10 11 25	20 41 35	R	1175cK5	4.9	81-	128	13 77
10 03 29	2 38 24	d	1670 K4	4.8	98+	165	15 250	10 11 30	2 2 27	R	1670 K4	4.8	35-	73	18 114
10 04 24	23 5 33	d	1605 K3	6.0	84+	132	29 235	10 12 03	4 25 39	R	2051 A*	5.9v	8-	32	4 121
10 05 20	12 39 41	d	1428SA5	3.5	45+	85	58 24 101	10 12 13	17 50 49	M	3453wA0	5.0v	51+	91	45 195
10 06 06	2 17 1	M	3501 *5	5.0v	39-	77	-10 26 113	10 12 21	18 7 11	R	976SM3	2.9v	100-	174	22 79
10 06 23	20 16 27	d	2269cB5	5.4	93+	149	-10 20 170	10 12 23	6 5 16	R	1175cK5	4.9	96-	156	-7 21 276
10 06 23	23 5 50	d	2286 B5	5.4v	93+	150	14 209	10 12 25	2 29 48	R	1410WK3	5.1	82-	130	54 180
10 06 28	23 52 32	R	2987SF3	4.9	94-	152	24 159	10 12 31	3 46 27	R	2134SK4	5.9	18-	51	6 129
10 07 02	23 14 37	m	3453wA0	5.0v	65-	108	15 104								
10 07 07	3 13 3	r	399SA0	5.7	25-	60	-3 38 100								
10 07 24	20 23 25	d	2822 A6	5.6	99+	167	17 151								
10 07 25	0 31 47	d	2838cK1	5.6	99+	168	17 210								

Data nel formato anno/mese/giorno, ore in T.U.

P : tipo di fenomeno

D = sparizione	d = sparizione visibile con difficoltà
R = riapparizione	r = riapparizione visibile con difficoltà
G = radente	g = radente visibile con difficoltà
	m = missing

Stella : nnnn = ZC catalogue no.  
nnnnn or nnnnnn = SAO catalogue number  
Xnnnnn = XZ80 catalogue no.  
Pppnnnnn = Hubble catalogue

D : stella doppia (vedere codice XZ catalogue)  
Sp : tipo spettrale  
Mag : magnitudine  
V : stella variabile ad eclisse (e), varia (v), sospetta (s)  
% : percentuale di Luna illuminata  
Elon : elongazione della Luna, in gradi  
Sole alt : altezza del Sole, in gradi  
Luna alt : altezza della Luna sull'orizzonte, in gradi  
Luna az : azimut della Luna, in gradi

Date in the format year/month/day, times in T.U.

P : type of phenomenon

D = desapparing	d = desapparing, visibile with difficulty
R = reapparing	r = reapparing, visibile with difficulty
G = radent	g = radent, visibile with difficulty
	m = missing

Stella : nnnn = ZC catalogue no.  
nnnnn or nnnnnn = SAO catalogue number  
Xnnnnn = XZ80 catalogue no.  
Pppnnnnn = Hubble catalogue

D : double star (XZ catalogue)  
Sp : spectral type  
Mag : magnitude  
V : variable star : eclipse (e), variable (v), suspect (s)  
% : percentage of Moon illumination  
Elon : elongation of the Moon, in °  
Sun alt : height of the Sun, in °  
Moon alt : height of the Moon, in °  
Moon az : azimuth of the Moon, in °

# CONGIUNZIONI MULTIPLE PIANETI-LUNA-STELLE

(eventi con 1 o più pianeti, la Luna ed una stella di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS-MOON-STARS

(events with 1 or more planets, the Moon and a star with mag<2 within 5°)

### Geocentriche - Geocentric

Date	TT	Dmed	Dmax	emin	m2d	mmax				
2010/05/16	07:00:55	3.704	4.826	28	-3.8	1.7	Moon	Beta	TAU Elnath	Venus
2010/09/11	02:16:33	4.180	5.093	38	1.1	1.4	Moon	Alpha	VIR Spica	Mars
2010/11/07	23:50:00	3.204	4.499	22	1.1	1.2	Moon	Alpha	SCO Antares	Mars

### Topocentriche - Topocentric 42°N - 12°E

Date	UT	Dmed	Dmax	emin	m2d	mmax				
2010/05/16	06:16:11	3.920	4.808	29	-3.8	1.7	Moon	Beta	TAU Elnath	Venus

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest body

mmax = least magnitude

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# CONGIUNZIONI MULTIPLE MISTE

## CERCHI MINIMI GEOCENTRICI PIANETI-LUNA-STELLE

(eventi con 1 o più pianeti, la Luna ed una stella di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS

## LEAST GEOCENTRIC GROUPINGS PLANETS-MOON-STARS

(events with 1 or more planets, the Moon and a star with mag<2 within 5°)

DATE	TIME	BODIES			D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT
16	05 2010 02	VENUS	MOON	β TAU	4.3	4.7	3.9	5.0	28	-4.0	-6.5	1.6	-6.6
16	05 2010 03	VENUS	MOON	β TAU	3.8	4.7	3.7	4.9	28	-4.0	-6.5	1.6	-6.6
16	05 2010 04	VENUS	MOON	β TAU	3.3	4.7	3.6	4.8	29	-4.0	-6.5	1.6	-6.6
16	05 2010 05	VENUS	MOON	β TAU	2.7	4.7	3.6	4.8	29	-4.0	-6.6	1.6	-6.7
16	05 2010 06	VENUS	MOON	β TAU	2.2	4.8	3.6	4.8	29	-4.0	-6.6	1.6	-6.7
16	05 2010 07	VENUS	MOON	β TAU	1.7	4.8	3.8	4.8	29	-4.0	-6.7	1.6	-6.8
16	05 2010 08	VENUS	MOON	β TAU	1.2	4.8	4.1	4.9	30	-4.0	-6.7	1.6	-6.8
16	05 2010 09	VENUS	MOON	β TAU	0.6	4.8	4.4	4.9	30	-4.0	-6.8	1.6	-6.9
16	05 2010 10	VENUS	MOON	β TAU	0.1	4.9	4.7	4.9	30	-4.0	-6.8	1.6	-6.9
11	09 2010 03	MARS	MOON	α VIR	4.9	4.0	3.5	5.0	39	1.5	-7.4	0.9	-7.4
11	09 2010 04	MARS	MOON	α VIR	4.8	4.0	3.9	5.0	39	1.5	-7.5	0.9	-7.5
07	11 2010 18	MARS	MOON	α SCO	2.7	4.5	4.8	4.9	21	1.4	-6.0	0.9	-6.0
07	11 2010 19	MARS	MOON	α SCO	2.2	4.5	4.3	4.6	22	1.4	-6.0	0.9	-6.0
07	11 2010 20	MARS	MOON	α SCO	1.9	4.5	3.9	4.5	22	1.4	-6.1	0.9	-6.1
07	11 2010 21	MARS	MOON	α SCO	1.6	4.5	3.4	4.5	22	1.4	-6.1	0.9	-6.1
07	11 2010 22	MARS	MOON	α SCO	1.6	4.5	3.1	4.5	22	1.4	-6.2	0.9	-6.2
07	11 2010 23	MARS	MOON	α SCO	1.7	4.5	2.8	4.5	23	1.4	-6.2	0.9	-6.2
08	11 2010 00	MARS	MOON	α SCO	1.9	4.4	2.5	4.5	23	1.4	-6.3	0.9	-6.3
08	11 2010 01	MARS	MOON	α SCO	2.3	4.4	2.4	4.5	23	1.4	-6.3	0.9	-6.3
08	11 2010 02	MARS	MOON	α SCO	2.7	4.4	2.5	4.5	24	1.4	-6.4	0.9	-6.4
08	11 2010 03	MARS	MOON	α SCO	3.1	4.4	2.6	4.4	24	1.4	-6.4	0.9	-6.4
08	11 2010 04	MARS	MOON	α SCO	3.6	4.4	2.9	4.5	24	1.4	-6.5	0.9	-6.5
08	11 2010 05	MARS	MOON	α SCO	4.1	4.4	3.2	4.6	24	1.4	-6.5	0.9	-6.5
08	11 2010 06	MARS	MOON	α SCO	4.6	4.4	3.6	5.0	24	1.4	-6.5	0.9	-6.5

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

Date in the format day/month/year

Dxy = distance between the body x and y, in °

GROUP = least group, in degree

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# CONGIUNZIONI MULTIPLE MISTE

## CERCHI MINIMI TOPOCENTRICI PIANETI-LUNA-STELLE

(eventi con 1 o più pianeti, la Luna ed una stella di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS

## LEAST TOPOCENTRIC GROUPINGS PLANETS-MOON-STARS

(events with 1 or more planets, the Moon and a star with mag<2 within 5°)

42°N - 12°E

DATE	TIME		BODIES		D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
16 mag	2010 03	VENUS	MOON	β TAU	3.5	4.7	4.4	5.0	28	-4.0	-6.5	1.6	-6.6	-19	24	-8	40
16 mag	2010 04	VENUS	MOON	β TAU	2.8	4.7	4.4	4.9	29	-4.0	-6.5	1.6	-6.6	-13	37	-1	53
16 mag	2010 05	VENUS	MOON	β TAU	2.2	4.7	4.4	4.8	29	-4.0	-6.6	1.6	-6.7	-5	49	6	65
16 mag	2010 06	VENUS	MOON	β TAU	1.6	4.8	4.5	4.8	29	-4.0	-6.6	1.6	-6.7	4	59	14	77
16 mag	2010 07	VENUS	MOON	β TAU	1.0	4.8	4.6	4.8	29	-4.0	-6.7	1.6	-6.8	14	68	23	88
16 mag	2010 08	VENUS	MOON	β TAU	0.6	4.8	4.9	4.9	30	-4.0	-6.7	1.6	-6.8	24	77	32	101
07	11 2010 19	MARS	MOON	α SCO	3.1	4.5	4.6	4.9	22	1.4	-6.0	0.9	-6.0	-22	258	-23	273
07	11 2010 20	MARS	MOON	α SCO	2.7	4.5	4.1	4.6	22	1.4	-6.1	0.9	-6.1	-33	267	-31	285
07	11 2010 21	MARS	MOON	α SCO	2.3	4.5	3.5	4.5	22	1.4	-6.1	0.9	-6.1	-44	278	-40	300
07	11 2010 22	MARS	MOON	α SCO	2.0	4.5	3.0	4.5	22	1.4	-6.2	0.9	-6.2	-54	291	-46	317
07	11 2010 23	MARS	MOON	α SCO	1.9	4.5	2.6	4.5	23	1.4	-6.2	0.9	-6.2	-64	310	-51	338
08	11 2010 00	MARS	MOON	α SCO	2.1	4.4	2.3	4.5	23	1.4	-6.3	0.9	-6.3	-70	341	-53	2
08	11 2010 01	MARS	MOON	α SCO	2.5	4.4	2.2	4.5	23	1.4	-6.3	0.9	-6.3	-70	21	-50	25
08	11 2010 02	MARS	MOON	α SCO	3.1	4.4	2.3	4.5	24	1.4	-6.4	0.9	-6.4	-64	51	-45	45
08	11 2010 03	MARS	MOON	α SCO	3.7	4.4	2.6	4.4	24	1.4	-6.4	0.9	-6.4	-54	70	-38	62
08	11 2010 04	MARS	MOON	α SCO	4.3	4.4	3.0	4.7	24	1.4	-6.5	0.9	-6.5	-44	83	-30	76

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

Dxy = distance between the body x and y, in °

GROUP = least group, in degree

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# EVENTI GEOCENTRICI <5° LUNA-OGGETTI m<4

## GEOCENTRIC EVENTS <5° MOON-OBJECTS m<4

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)			
2010/01/02	13:59:08	3.03943	1.29456	0.002	20	-155	-12.6	3.7		Moon	NGC2632	M44
2010/01/25	11:16:13	0.02434	1.23554	0.003	171	115	-11.5	1.6	3341	Moon		M45
2010/01/30	01:20:48	3.03252	1.30344	0.002	20	177	-12.8	3.7		Moon	NGC2632	M44
2010/02/21	18:50:56	0.11504	1.21627	0.003	351	87	-10.9	1.6	3382	Moon		M45
2010/02/26	12:33:06	3.07637	1.29287	0.002	20	149	-12.5	3.7		Moon	NGC2632	M44
2010/03/21	00:30:34	0.33957	1.20783	0.003	351	60	-10.1	1.6	3272	Moon		M45
2010/03/25	21:27:52	3.24408	1.27170	0.002	20	122	-11.8	3.7		Moon	NGC2632	M44
2010/04/17	06:08:36	0.52785	1.21245	0.003	351	33	-8.8	1.6	3044	Moon		M45
2010/04/22	03:46:15	3.49000	1.25615	0.002	20	95	-11.1	3.7		Moon	NGC2632	M44
2010/05/14	13:17:54	0.59945	1.22263	0.003	351	7	-5.6	1.6	2917	Moon		M45
2010/05/19	09:05:38	3.70525	1.25649	0.002	20	69	-10.4	3.7		Moon	NGC2632	M44
2010/06/10	22:11:01	0.57403	1.22854	0.003	351	-20	-7.8	1.6	2950	Moon		M45
2010/06/15	15:34:04	3.81221	1.27047	0.002	20	43	-9.5	3.7		Moon	NGC2632	M44
2010/07/08	07:51:26	0.54801	1.22436	0.003	351	-46	-9.5	1.6	3006	Moon		M45
2010/07/13	00:15:25	3.81923	1.28685	0.002	20	17	-7.5	3.7		Moon	NGC2632	M44
2010/08/04	16:54:51	0.61765	1.21111	0.003	351	-72	-10.4	1.6	2934	Moon		M45
2010/08/09	10:40:43	3.81198	1.29342	0.002	20	-10	-6.4	3.7		Moon	NGC2632	M44
2010/09/01	00:18:46	0.80540	1.19599	0.003	351	-98	-11.0	1.6	2554	Moon		M45
2010/09/05	21:16:09	3.88979	1.28436	0.002	19	-36	-9.2	3.7		Moon	NGC2632	M44
2010/09/28	06:08:23	1.04044	1.18781	0.003	351	-125	-11.7	1.6	1672	Moon		M45
2010/10/03	06:15:43	4.08550	1.26436	0.002	19	-63	-10.3	3.7		Moon	NGC2632	M44
2010/10/25	11:43:53	1.21064	1.19030	0.003	352	-152	-12.3	1.6		Moon		M45
2010/10/30	12:51:35	4.33157	1.24692	0.002	19	-90	-11.0	3.7		Moon	NGC2632	M44
2010/11/21	18:41:43	1.25483	1.19870	0.003	352	177	-12.7	1.6		Moon		M45
2010/11/26	18:11:51	4.51133	1.24486	0.002	19	-117	-11.6	3.7		Moon	NGC2632	M44
2010/12/19	03:33:26	1.22537	1.20337	0.003	352	153	-12.4	1.6		Moon		M45
2010/12/24	00:42:05	4.56086	1.25863	0.002	19	-145	-12.3	3.7		Moon	NGC2632	M44

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della Luna

m\* = magnitudine dell'oggetto

tm = se presente, l'oggetto viene occultato massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Alt = height in ° on the horizon of the event in the central moment

R1 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in °

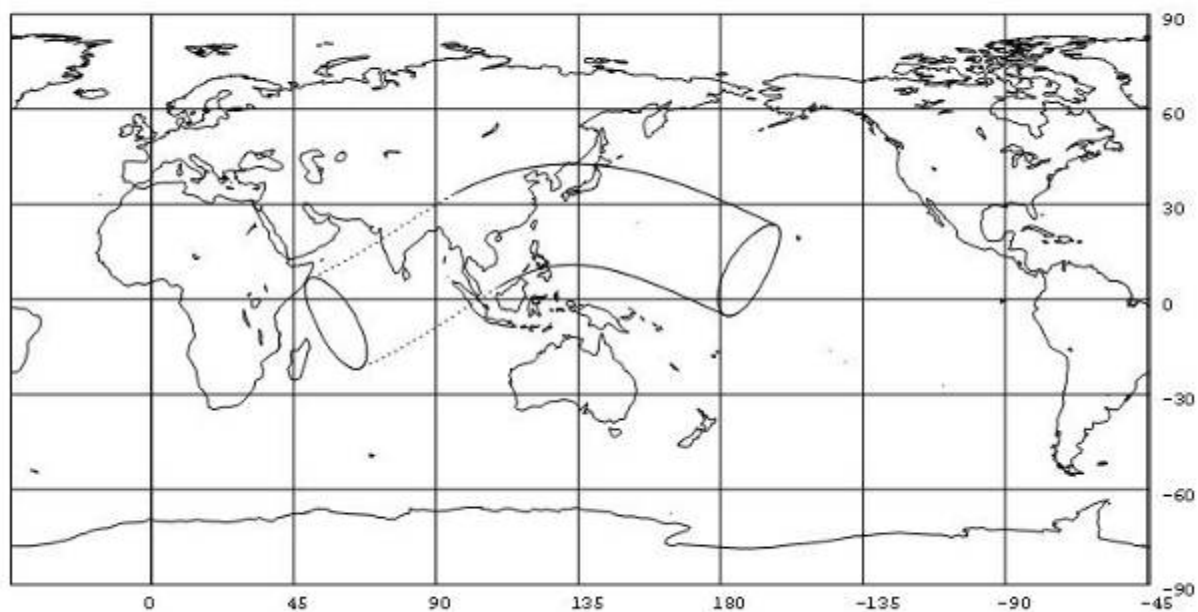
e = elongation, in degree

m1 = magnitude of the Moon

m\* = magnitude of the object

tm = if present, the star is occulted maximum for x seconds

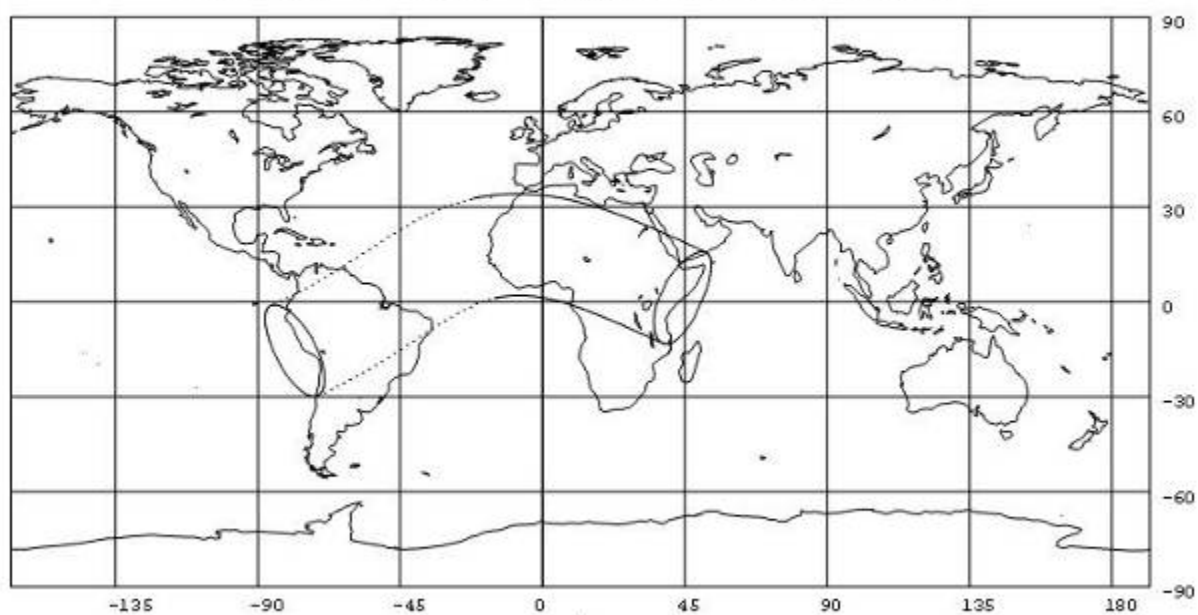
### Occultation of Pleiadi, Magnitude 1.6, on 2010 Jan 25



Occult4.0.5.0

UT of conjunction = 11h 31.9m

### Occultation of Pleiadi, Magnitude 1.6, on 2010 Feb 21



Occult4.0.5.0

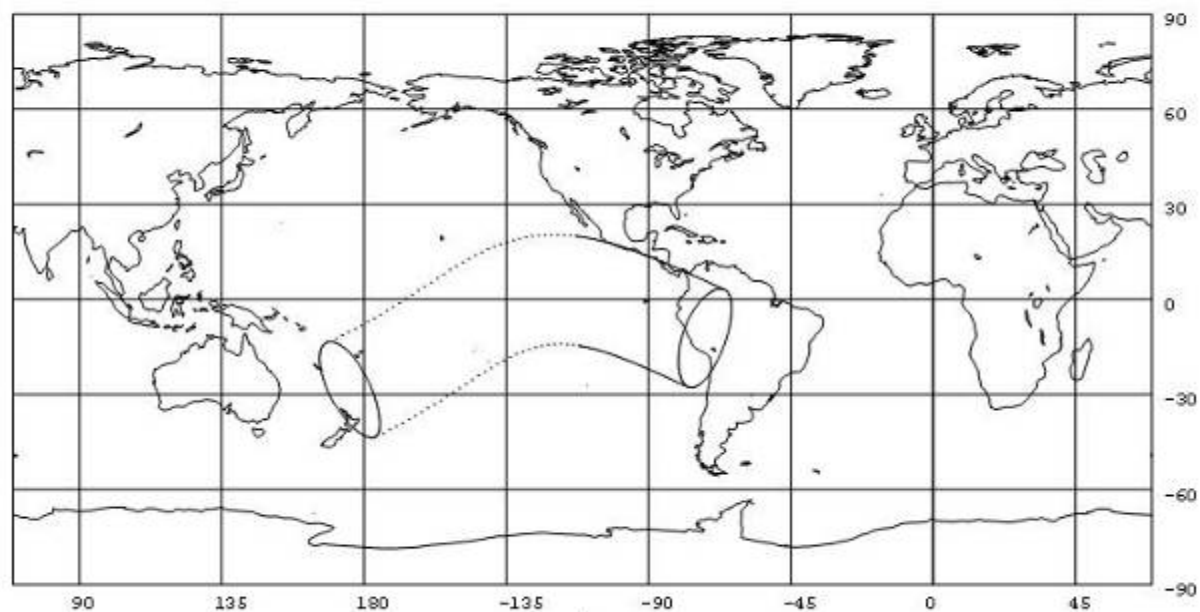
UT of conjunction = 19h 47m

Vedere i dettagli sul mio sito : [www.pierpaoloricci.it](http://www.pierpaoloricci.it)

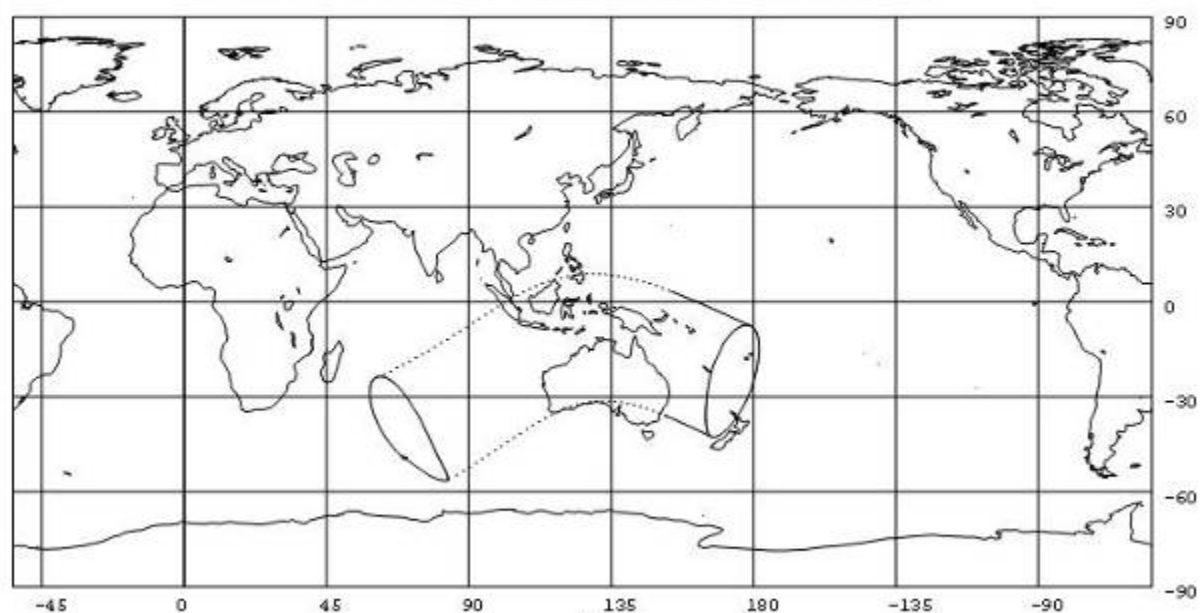
See details on my site : [www.pierpaoloricci.it/index\\_eng.htm](http://www.pierpaoloricci.it/index_eng.htm)

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### Occultation of Pleiadi, Magnitude 1.6, on 2010 Mar 21



### Occultation of Pleiadi, Magnitude 1.6, on 2010 Apr 17

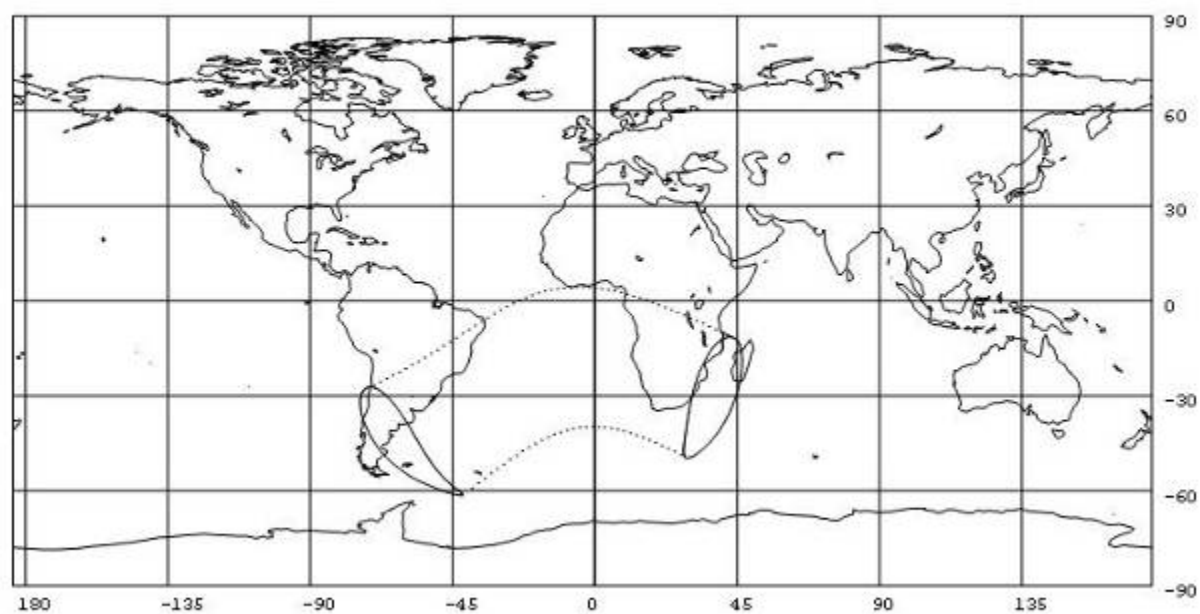


Vedere i dettagli sul mio sito : [www.pierpaoloricci.it](http://www.pierpaoloricci.it)

See details on my site : [www.pierpaoloricci.it/index\\_eng.htm](http://www.pierpaoloricci.it/index_eng.htm)

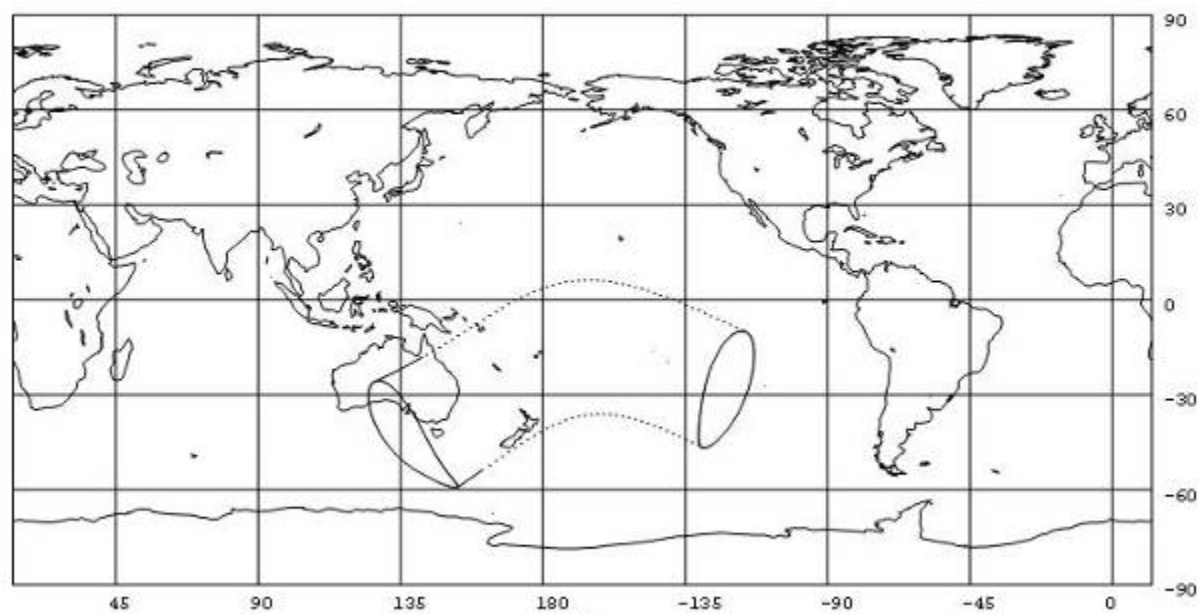


Occultation of Pleiadi, Magnitude 1.6, on 2010 May 14



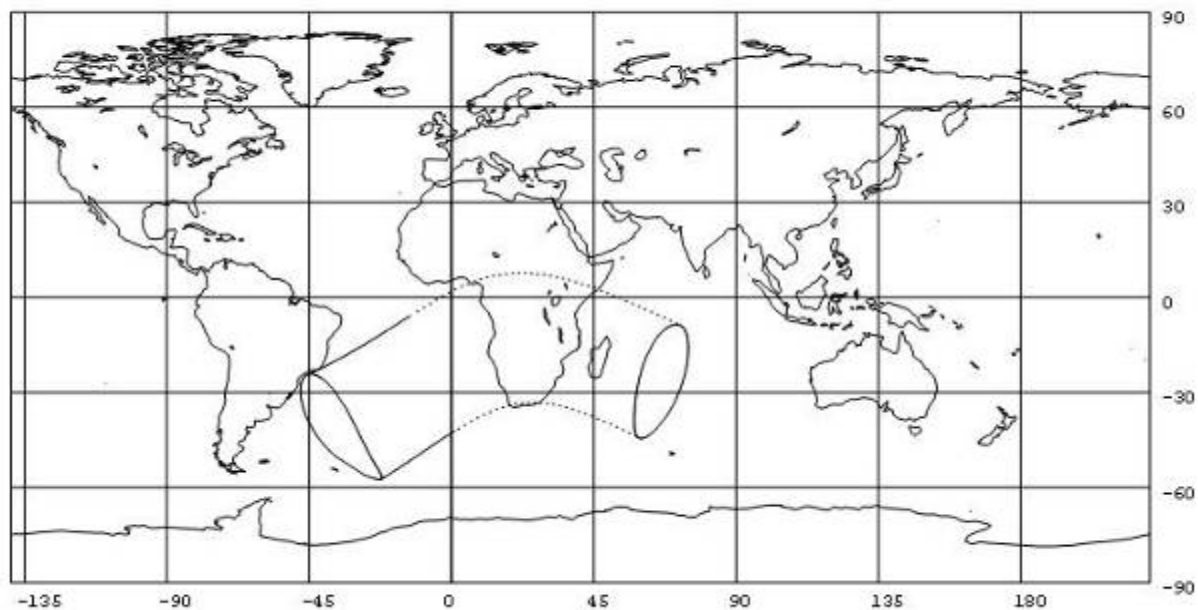
UT of conjunction = 13h 23.5m

Occultation of Pleiadi, Magnitude 1.6, on 2010 Jun 10



UT of conjunction = 22h 17.1m

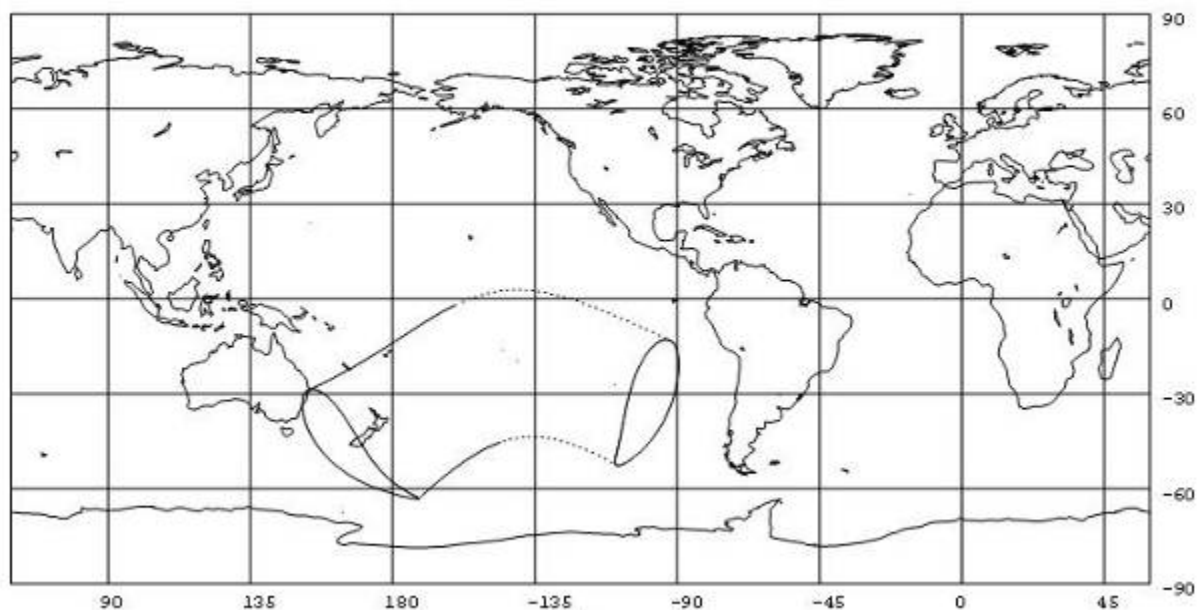
# Occultation of Pleiadi, Magnitude 1.6, on 2010 Jul 8



Occult4.0.5.0

UT of conjunction = 7h 58.1m

# Occultation of Pleiadi, Magnitude 1.6, on 2010 Aug 4



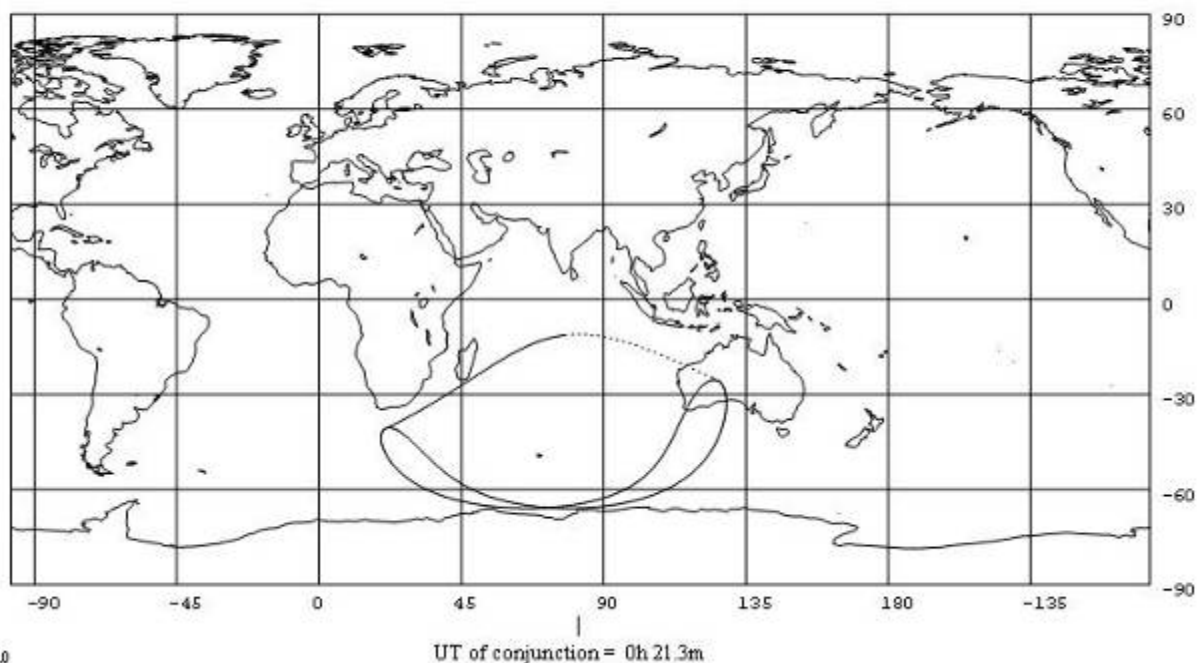
Occult4.0.5.0

UT of conjunction = 17h 0.5m

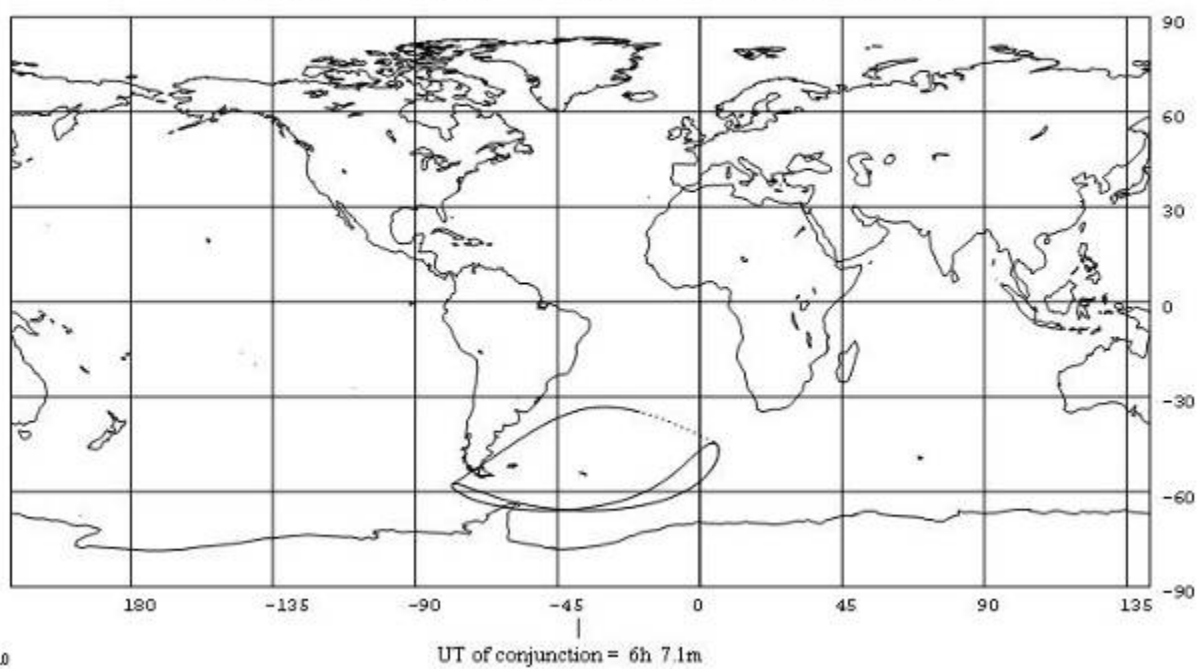
Vedere i dettagli sul mio sito : [www.pierpaoloricci.it](http://www.pierpaoloricci.it)

See details on my site : [www.pierpaoloricci.it/index\\_eng.htm](http://www.pierpaoloricci.it/index_eng.htm)

### Occultation of Pleiadi, Magnitude 1.6, on 2010 Sep 1



### Occultation of Pleiadi, Magnitude 1.6, on 2010 Sep 28



Vedere i dettagli sul mio sito : [www.pierpaoloricci.it](http://www.pierpaoloricci.it)

See details on my site : [www.pierpaoloricci.it/index\\_eng.htm](http://www.pierpaoloricci.it/index_eng.htm)

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# EVENTI TOPOCENTRICI <5° LUNA-OGGETTI m<4

## TOPOCENTRIC EVENTS <5° MOON-OBJECTS m<4

42°N - 12°E

Date	UT	Dm	Alt.	r1	p	e	m1	m*	tm (s)		
2010/01/25	10:30:5	0.81590	-6.55	0.003	347	115	-11.5	1.6		Moon	M45
2010/01/30	00:30:4	3.58931	59.79	0.002	30	176	-12.9	3.7		Moon	NGC2632 M44
2010/02/21	19:44:0	0.40382	51.02	0.003	355	87	-10.9	1.6		Moon	M45
2010/02/26	12:02:3	3.71004	-21.66	0.002	13	150	-12.5	3.7		Moon	NGC2632 M44
2010/03/21	01:11:1	1.09958	-19.38	0.003	356	60	-10.1	1.6		Moon	M45
2010/03/25	20:24:1	3.75387	62.66	0.002	29	121	-11.8	3.7		Moon	NGC2632 M44
2010/04/17	05:24:1	1.33963	-4.72	0.003	347	33	-8.8	1.6		Moon	M45
2010/04/22	04:09:1	4.36628	-27.65	0.002	17	95	-11.1	3.7		Moon	NGC2632 M44
2010/05/14	14:03:0	0.89282	54.08	0.003	354	7	-5.5	1.6		Moon	M45
2010/05/19	08:23:3	4.18994	-7.08	0.002	13	69	-10.4	3.7		Moon	NGC2632 M44
2010/06/10	22:11:3	1.44496	-25.05	0.003	353	-20	-7.8	1.6		Moon	M45
2010/06/15	14:16:0	4.27182	64.17	0.002	28	42	-9.5	3.7		Moon	NGC2632 M44
2010/07/08	08:02:3	0.85026	71.31	0.002	347	-46	-9.6	1.6		Moon	M45
2010/08/04	17:16:2	1.43593	-24.03	0.003	355	-72	-10.4	1.6		Moon	M45
2010/08/09	09:23:4	4.18021	59.62	0.002	25	-10	-6.5	3.7		Moon	NGC2632 M44
2010/08/31	23:35:4	1.40939	27.80	0.003	343	-98	-11.1	1.6		Moon	M45
2010/09/28	07:08:1	1.42268	30.98	0.003	358	-125	-11.7	1.6		Moon	M45
2010/10/03	04:55:2	4.40860	52.24	0.002	23	-63	-10.3	3.7		Moon	NGC2632 M44
2010/10/25	11:59:5	2.01694	-24.85	0.003	355	-152	-12.3	1.6		Moon	M45
2010/11/21	18:04:1	1.87372	25.75	0.003	343	-178	-12.7	1.6		Moon	M45
2010/12/19	04:30:2	1.81022	1.54	0.003	359	152	-12.4	1.6		Moon	M45
2010/12/23	23:19:3	4.88184	49.88	0.002	22	-145	-12.4	3.7		Moon	NGC2632 M44

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Alt = altezza in gradi sull'orizzonte dell'evento nel momento centrale

R1 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della Luna

m\* = magnitudine dell'oggetto

tm = se presente, l'oggetto viene occultato massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Alt = height in ° on the horizon of the event in the central moment

R1 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the Moon

m\* = magnitude of the object

tm = if present, the star is occulted maximum for x seconds

# CONGIUNZIONI MULTIPLE PIANETI-LUNA-OGGETTI

(eventi con 1 pianeta, la Luna ed un oggetto di mag<4 entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS-MOON-OBJECTS

(events with 1 planet, the Moon and an object with mag<4 within 5°)

### Geocentriche - Geocentric

Date	TT	Dmed	Dmax	emin	m2d	mmax				
2010/04/22 05:09:34		3.473	4.438	96	0.5	3.7	Moon	NGC2632	M44	Mars
2010/07/12 23:29:15		3.264	3.975	16	-0.7	3.7	Moon	NGC2632	M44	Mercury

### Topocentriche - Topocentric 42°N - 12°E

Date	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest body

mmax = least magnitude

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# CONGIUNZIONI MULTIPLE MISTE

## CERCHI MINIMI GEOCENTRICI

### PIANETI - LUNA - OGGETTI MESSIER

(eventi con 1 pianeta, la Luna ed un oggetto di mag<4 entro 5°)

### MULTIPLE CONJUNCTIONS

### LEAST GEOCENTRIC GROUPINGS

### PLANETS - MOON - MESSIER OBJECTS

(events with 1 planet, the Moon and an object with mag<4 within 5°)

DATE	TIME	BODIES			D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT
22	04 2010 03	MARS	MOON	PRESEPE	4.8	2.0	3.2	4.8	96	0.6	-10.3	3.7	-10.3
22	04 2010 04	MARS	MOON	PRESEPE	4.6	2.0	3.2	4.6	96	0.6	-10.3	3.7	-10.3
22	04 2010 05	MARS	MOON	PRESEPE	4.4	2.0	3.2	4.5	96	0.6	-10.3	3.7	-10.3
22	04 2010 06	MARS	MOON	PRESEPE	4.3	2.0	3.4	4.4	97	0.6	-10.4	3.7	-10.4
22	04 2010 07	MARS	MOON	PRESEPE	4.3	2.0	3.7	4.4	97	0.6	-10.4	3.7	-10.4
22	04 2010 08	MARS	MOON	PRESEPE	4.4	2.0	4.0	4.4	97	0.6	-10.4	3.7	-10.4
22	04 2010 09	MARS	MOON	PRESEPE	4.5	2.0	4.4	4.6	98	0.6	-10.4	3.7	-10.4
22	04 2010 10	MARS	MOON	PRESEPE	4.7	2.0	4.8	4.9	98	0.6	-10.4	3.7	-10.4
12	07 2010 19	MERCURY	MOON	PRESEPE	4.2	1.5	4.8	4.8	15	-0.7	-5.3	3.7	-5.3
12	07 2010 20	MERCURY	MOON	PRESEPE	4.0	1.4	4.4	4.4	15	-0.7	-5.4	3.7	-5.4
12	07 2010 21	MERCURY	MOON	PRESEPE	3.9	1.4	4.0	4.1	15	-0.7	-5.5	3.7	-5.5
12	07 2010 22	MERCURY	MOON	PRESEPE	3.9	1.3	3.8	3.9	16	-0.7	-5.5	3.7	-5.5
12	07 2010 23	MERCURY	MOON	PRESEPE	3.9	1.2	3.6	3.9	16	-0.7	-5.6	3.7	-5.6
13	07 2010 00	MERCURY	MOON	PRESEPE	4.0	1.1	3.5	4.0	16	-0.7	-5.6	3.7	-5.6
13	07 2010 01	MERCURY	MOON	PRESEPE	4.2	1.1	3.5	4.2	17	-0.7	-5.7	3.7	-5.7
13	07 2010 02	MERCURY	MOON	PRESEPE	4.4	1.0	3.7	4.4	17	-0.7	-5.7	3.7	-5.7
13	07 2010 03	MERCURY	MOON	PRESEPE	4.7	0.9	3.9	4.7	17	-0.7	-5.8	3.7	-5.8
13	07 2010 04	MERCURY	MOON	PRESEPE	5.0	0.9	4.2	5.0	17	-0.7	-5.8	3.7	-5.8

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

Date in the format day/month/year

Dxy = distance between the body x and y, in °

GROUP = least group, in degree

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

Times in U.T.

# CONGIUNZIONI MULTIPLE MISTE CERCHI MINIMI TOPOCENTRICI PIANETI - LUNA - OGGETTI MESSIER

(eventi con 1 pianeta, la Luna ed un oggetto di mag<4 entro 5°)

## MULTIPLE CONJUNCTIONS LEAST TOPOCENTRIC GROUPINGS PLANETS - MOON - MESSIER OBJECTS

(events with 1 planet, the Moon and an object with mag<4 within 5°)  
42°N - 12°E

DATE	TIME	BODIES			D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
12	07 2010 21	MERCURY	MOON	PRESEPE	4.9	1.4	5.0	5.0	15	-0.7	-5.5	3.7	-5.5	-14	311	-3	315
12	07 2010 22	MERCURY	MOON	PRESEPE	4.8	1.3	4.7	4.8	16	-0.7	-5.5	3.7	-5.5	-22	324	-9	328
12	07 2010 23	MERCURY	MOON	PRESEPE	4.8	1.2	4.4	4.8	16	-0.7	-5.6	3.7	-5.6	-27	338	-12	341
13	07 2010 00	MERCURY	MOON	PRESEPE	4.8	1.1	4.3	4.9	16	-0.7	-5.6	3.7	-5.6	-30	353	-14	356

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Ore in T.U.

Date in the format day/month/year

Dxy = distance between the body x and y, in °

GROUP = least group, in degree

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.



# PIANETI-LUNA-STELLE IN LINEA RETTA GEOCENTRICI PLANETS-MOON-STARS IN STRAIGHT LINE GEOCENTRIC

DATE	TIMES		BODIES		C
16 05 2010	10	VENUS	MOON	$\beta$ TAU	0.103
07 11 2010	23	MARS	MOON	$\alpha$ SCO	-0.255

# PIANETI-LUNA-STELLE IN LINEA RETTA TOPOCENTRICI PLANETS-MOON-STARS IN STRAIGHT LINE TOPOCENTRIC

42°N - 12°E

DATE	TIMES		BODIES		C	ALT	AZ	ALT.S.	AZ.S
08 11 2010	00	MARS	MOON	$\alpha$ SCO	0.316	-70	341	-53	2

Quanto più il parametro C è prossimo a zero tanto più i corpi sono allineati

Date, Time = data ed ora

Bodies = corpi

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

How much anymore the parameter C is next to zero so much the bodies are lined up

Date in the format day/month/year

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# PIANETI-LUNA-OGGETTI IN LINEA RETTA GEOCENTRICI

## PLANETS-MOON-OBJECTS IN STRAIGHT LINE

### GEOCENTRIC

DATE	TIMES	BODIES	C	ALT	AZ	ALT.S.	AZ.S
------	-------	--------	---	-----	----	--------	------

Questo anno non avvengono fenomeni - No phenomena this year

# PIANETI-LUNA-OGGETTI IN LINEA RETTA

## PLANETS-MOON-STARS IN STRAIGHT LINE

### TOPOCENTRIC

42°N - 12°E

DATE	TIMES	BODIES	C	ALT	AZ	ALT.S.	AZ.S
------	-------	--------	---	-----	----	--------	------

Questo anno non avvengono fenomeni - No phenomena this year

Quanto più il parametro C è prossimo a zero tanto più i corpi sono allineati

Date, Time = data ed ora

Bodies = corpi

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Ore in T.U.

How much anymore the parameter C is next to zero so much the bodies are lined up

Date in the format day/month/year

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

# GEOMETRIE SPAZIALI PIANETI-LUNA-OGGETTI TRIANGOLI EQUILATERI SPATIAL GEOMETRIES PLANETS-MOON-OBJECTS EQUILATERAL TRIANGLES Geocentrici - geocentric

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
Questo anno non avvengono fenomeni - No phenomena this year															

# GEOMETRIE SPAZIALI PIANETI-LUNA-OGGETTI TRIANGOLI EQUILATERI SPATIAL GEOMETRIES PLANETS-MOON-OBJECTS EQUILATERAL TRIANGLES 42°N - 12°E

DATE	TIME	BODIES	D12	D13	D23	GROUP	EL.	MAG1	MAG2	MAG3	MAGT	ALT	AZ	ALT.S.	AZ.S.
Questo anno non avvengono fenomeni - No phenomena this year															

Date, Time = data ed ora

Bodies = corpi

Dxy = distanza tra il corpo x e quello y, in gradi

Group = cerchio minimo comprendente tutto il gruppo, in gradi

EL = elongazione dal Sole, in gradi

MAGx = magnitudine del corpo x

MAGT = magnitudine totale del gruppo

ALT = altezza sull'orizzonte del baricentro geometrico del gruppo, in gradi

AZ = azimut del baricentro geometrico del gruppo, in gradi da nord

ALT.S. = altezza sull'orizzonte del Sole, in gradi

AZ.S. = azimut del Sole, in gradi da nord

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Ore in T.U.

Si è considerato equilatero ogni triangolo in cui ogni cateto differisce dall'altro per massimo  $\pm 10\%$ .  
Si è considerato quadrato ogni quadrilatero in cui ogni lato differisce dall'altro per massimo  $\pm 10\%$  e con diagonali diverse meno del  $15\%$ .

NB : queste tabelle sono state create esclusivamente ai fini di "foto d'effetto", con tre o quattro corpi celesti praticamente equidistanti!

Date in the format day/month/year

Dxy = distance between the body x and y, in °

DQM = middle distance between the 4 bodies, in °

MAX = maxima distance between the 4 bodies, in °

EL = elongation from the Sun, in °

MAGx = magnitude of body x

MAGT = total magnitude

ALT = height on the horizon of the baricenter of the group, in °

AZ = azimuth of the baricenter of the group, in ° from north

ALT.S. = height on the horizon of the Sun, in °

AZ.S. = azimuth of the Sun, in ° from north

Times in U.T.

I have considered equilateral every triangle in which every cathetus differs from the other for maximum  $\pm 10\%$ .

I have considered square every quadrilateral in which every side differs from the other for maximum  $\pm 10\%$  and with diagonal different less than  $15\%$ .

NB: these charts are been created exclusively to the goals of "photo of effect", with three or four equidistant celestial bodies!

# CONGIUNZIONI LUNARI GEOCENTRICHE <1° CON LE PLEIADI LUNAR GEOCENTRIC CONJUNCTIONS <1° WITH THE PLEIADES

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)	tw(h)		
2010/01/25	10:25:46	0.05153	1.23481	0.003	351	114	-11.5	3.7	3340	3.7	Moon	TAU Electra
2010/01/25	10:52:43	0.26678	1.23520	0.003	351	114	-11.5	3.9	3263	3.7	Moon	TAU Maia
2010/01/25	11:27:30	0.05368	1.23570	0.003	171	115	-11.5	2.9	3338	3.7	Moon	TAU Alcyone
2010/01/25	12:06:25	0.16578	1.23626	0.003	171	115	-11.6	3.6	3309	3.7	Moon	TAU Atlas
2010/02/21	17:58:50	0.19099	1.21565	0.003	351	87	-10.8	3.7	3357	3.8	Moon	TAU Electra
2010/02/21	18:26:40	0.40620	1.21598	0.003	351	87	-10.8	3.9	3203	3.7	Moon	TAU Maia
2010/02/21	19:02:36	0.08568	1.21641	0.003	351	87	-10.8	2.9	3388	3.8	Moon	TAU Alcyone
2010/02/21	19:42:47	0.02648	1.21690	0.003	171	87	-10.9	3.6	3394	3.8	Moon	TAU Atlas
2010/03/20	23:37:54	0.41494	1.20737	0.003	351	59	-10.1	3.7	3203	3.8	Moon	TAU Electra
2010/03/21	00:06:01	0.63046	1.20761	0.003	351	60	-10.1	3.9	2909	3.7	Moon	TAU Maia
2010/03/21	00:42:21	0.31033	1.20793	0.003	351	60	-10.1	2.9	3295	3.8	Moon	TAU Alcyone
2010/03/21	01:23:00	0.19861	1.20829	0.003	351	60	-10.1	3.6	3362	3.8	Moon	TAU Atlas
2010/04/17	05:16:33	0.60182	1.21208	0.003	351	33	-8.8	3.7	2936	3.6	Moon	TAU Electra
2010/04/17	05:44:15	0.81809	1.21228	0.003	351	33	-8.8	3.9	2496	3.5	Moon	TAU Maia
2010/04/17	06:20:16	0.49893	1.21253	0.003	351	33	-8.9	2.9	3082	3.7	Moon	TAU Alcyone
2010/04/17	07:00:28	0.38828	1.21282	0.003	351	34	-8.9	3.6	3203	3.7	Moon	TAU Atlas
2010/05/14	12:26:47	0.67173	1.22221	0.003	351	7	-5.5	3.7	2797	3.5	Moon	TAU Electra
2010/05/14	12:53:53	0.88889	1.22244	0.003	351	7	-5.6	3.9	2298	3.4	Moon	TAU Maia
2010/05/14	13:29:22	0.57090	1.22273	0.003	351	7	-5.6	2.9	2960	3.6	Moon	TAU Alcyone
2010/05/14	14:08:51	0.46154	1.22305	0.003	351	8	-5.7	3.6	3099	3.6	Moon	TAU Atlas
2010/06/10	21:20:17	0.64513	1.22799	0.003	351	-20	-7.8	3.7	2841	3.5	Moon	TAU Electra
2010/06/10	21:47:08	0.86292	1.22828	0.003	351	-20	-7.8	3.9	2375	3.4	Moon	TAU Maia
2010/06/10	22:22:24	0.54575	1.22867	0.003	351	-20	-7.8	2.9	2989	3.6	Moon	TAU Alcyone
2010/06/10	23:01:36	0.43731	1.22909	0.003	352	-20	-7.7	3.6	3117	3.6	Moon	TAU Atlas
2010/07/08	07:00:08	0.61878	1.22368	0.003	351	-47	-9.6	3.7	2902	3.6	Moon	TAU Electra
2010/07/08	07:27:16	0.83674	1.22404	0.003	351	-46	-9.5	3.9	2454	3.4	Moon	TAU Maia
2010/07/08	08:02:57	0.51981	1.22451	0.003	351	-46	-9.5	2.9	3043	3.6	Moon	TAU Alcyone
2010/07/08	08:42:35	0.41162	1.22503	0.003	352	-46	-9.5	3.6	3164	3.7	Moon	TAU Atlas
2010/08/04	16:02:14	0.68862	1.21041	0.003	351	-73	-10.4	3.7	2806	3.6	Moon	TAU Electra
2010/08/04	16:30:04	0.90648	1.21078	0.003	351	-72	-10.4	3.9	2262	3.5	Moon	TAU Maia
2010/08/04	17:06:39	0.58939	1.21126	0.003	351	-72	-10.4	2.9	2979	3.7	Moon	TAU Alcyone
2010/08/04	17:47:18	0.48105	1.21181	0.003	352	-72	-10.4	3.6	3128	3.7	Moon	TAU Atlas
2010/08/31	23:24:48	0.87637	1.19538	0.003	351	-99	-11.1	3.7	2351	3.6	Moon	TAU Electra
2010/09/01	00:30:52	0.77714	1.19612	0.003	351	-98	-11.0	2.9	2626	3.7	Moon	TAU Alcyone
2010/09/01	01:12:34	0.66877	1.19660	0.003	352	-98	-11.0	3.6	2864	3.7	Moon	TAU Atlas
2010/09/28	07:02:46	0.90457	1.18827	0.003	352	-125	-11.7	3.6	2247	3.6	Moon	TAU Atlas

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della Luna

m\* = magnitudine della stella

tm = se presente, la stella viene occultata massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di 1° tra loro

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

R1 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the Moon

m\* = magnitude of the star

tm = if present, the star is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than 1°

# CONGIUNZIONI LUNARI TOPOCENTRICHE <1° CON LE PLEIADI LUNAR TOPOCENTRIC CONJUNCTIONS <1° WITH THE PLEIADES 42°N - 12°E

Date	TT	Dm	Alt	r1	p	e	m1	m*	tm(s)	tw(h)		
2010/01/25	09:48:23	0.91770	-12.08	0.003	348	114	-11.5	3.7		2.7	Moon	TAU Electra
2010/01/25	10:12:13	1.11993	-9.06	0.003	347	114	-11.5	3.9		2.6	Moon	TAU Maia
2010/01/25	10:40:25	0.77942	-5.20	0.003	347	115	-11.5	2.9		2.9	Moon	Eta TAU Alcyone
2010/01/25	11:13:45	0.63905	-0.32	0.003	346	115	-11.6	3.6		3.0	Moon	TAU Atlas
2010/02/21	18:35:12	0.46084	62.38	0.003	351	87	-10.9	3.7		5.3	Moon	TAU Electra
2010/02/21	19:10:54	0.68250	56.70	0.003	353	87	-10.9	3.9		5.0	Moon	TAU Maia
2010/02/21	19:59:16	0.38228	48.36	0.003	355	87	-10.9	2.9		4.9	Moon	Eta TAU Alcyone
2010/02/21	20:50:03	0.30494	39.28	0.003	357	87	-10.9	3.6		4.6	Moon	TAU Atlas
2010/03/21	00:27:42	1.12908	-15.16	0.003	356	59	-10.0	3.7		2.6	Moon	TAU Electra
2010/03/21	00:48:53	1.36879	-17.34	0.003	356	59	-10.0	3.9		2.3	Moon	TAU Maia
2010/03/21	01:20:57	1.07969	-20.17	0.003	356	60	-10.1	2.9		2.6	Moon	Eta TAU Alcyone
2010/03/21	01:54:03	0.99724	-22.44	0.003	355	60	-10.1	3.6		2.6	Moon	TAU Atlas
2010/04/17	04:38:52	1.44276	-10.90	0.003	348	33	-8.8	3.7		2.3	Moon	TAU Electra
2010/04/17	05:04:20	1.64431	-7.51	0.003	347	33	-8.8	3.9		2.0	Moon	TAU Maia
2010/04/17	05:34:25	1.30278	-3.22	0.003	347	33	-8.9	2.9		2.5	Moon	Eta TAU Alcyone
2010/04/17	06:10:12	1.16094	2.23	0.003	346	34	-8.9	3.6		2.8	Moon	TAU Atlas
2010/05/14	12:58:35	0.95257	64.18	0.003	351	7	-5.5	3.7		4.8	Moon	TAU Electra
2010/05/14	13:31:58	1.17305	59.20	0.003	353	7	-5.5	3.9		4.3	Moon	TAU Maia
2010/05/14	14:17:22	0.87049	51.62	0.003	355	7	-5.6	2.9		4.5	Moon	Eta TAU Alcyone
2010/05/14	15:06:08	0.79058	43.01	0.003	357	7	-5.7	3.6		4.4	Moon	TAU Atlas
2010/06/10	21:30:58	1.49845	-25.25	0.003	354	-21	-7.8	3.7		2.0	Moon	TAU Electra
2010/06/10	21:51:41	1.72642	-25.30	0.003	353	-20	-7.8	3.9		1.6	Moon	TAU Maia
2010/06/10	22:20:44	1.41948	-24.84	0.003	353	-20	-7.8	2.9		2.1	Moon	Eta TAU Alcyone
2010/06/10	22:52:10	1.31739	-23.64	0.003	352	-20	-7.7	3.6		2.2	Moon	TAU Atlas
2010/07/08	06:56:34	0.96741	67.25	0.003	344	-46	-9.6	3.7		4.7	Moon	TAU Electra
2010/07/08	07:34:40	1.15678	70.60	0.002	346	-46	-9.6	3.9		4.6	Moon	TAU Maia
2010/07/08	08:17:30	0.81511	70.99	0.002	348	-46	-9.6	2.9		5.1	Moon	Eta TAU Alcyone
2010/07/08	09:09:22	0.69391	66.64	0.002	351	-46	-9.6	3.6		5.1	Moon	TAU Atlas
2010/08/04	16:33:46	1.47329	-21.64	0.003	356	-73	-10.4	3.7		2.1	Moon	TAU Electra
2010/08/04	16:54:47	1.70928	-22.97	0.003	355	-73	-10.4	3.9		1.7	Moon	TAU Maia
2010/08/04	17:25:52	1.41414	-24.39	0.003	355	-72	-10.4	2.9		2.2	Moon	Eta TAU Alcyone
2010/08/04	17:58:32	1.32486	-25.14	0.003	354	-72	-10.4	3.6		2.2	Moon	TAU Atlas
2010/08/31	22:38:43	1.54811	17.66	0.003	343	-99	-11.1	3.7		2.6	Moon	TAU Electra
2010/08/31	23:13:04	1.72857	23.74	0.003	343	-98	-11.1	3.9		2.3	Moon	TAU Maia
2010/08/31	23:48:43	1.36495	30.15	0.003	342	-98	-11.1	2.9		3.3	Moon	Eta TAU Alcyone
2010/09/01	00:34:19	1.19875	38.42	0.003	342	-98	-11.1	3.6		3.8	Moon	TAU Atlas
2010/09/28	06:06:46	1.44016	42.04	0.003	357	-126	-11.7	3.7		3.7	Moon	TAU Electra
2010/09/28	06:36:00	1.68318	36.78	0.003	358	-126	-11.7	3.9		2.9	Moon	TAU Maia
2010/09/28	07:21:49	1.40798	28.54	0.003	359	-125	-11.7	2.9		3.3	Moon	Eta TAU Alcyone
2010/09/28	08:07:43	1.34891	20.41	0.003	359	-125	-11.7	3.6		3.2	Moon	TAU Atlas
2010/10/25	11:15:27	2.05381	-22.47	0.003	356	-153	-12.3	3.7		0.7	Moon	TAU Electra
2010/10/25	12:09:52	1.99522	-25.18	0.003	355	-152	-12.3	2.9		0.9	Moon	Eta TAU Alcyone
2010/10/25	12:44:04	1.90602	-25.79	0.003	354	-152	-12.3	3.6		1.3	Moon	TAU Atlas
2010/11/21	17:07:32	2.00538	15.73	0.003	344	178	-12.7	3.7		1.1	Moon	TAU Electra
2010/11/21	18:17:04	1.83083	28.07	0.003	343	-178	-12.7	2.9		2.1	Moon	Eta TAU Alcyone
2010/11/21	19:02:12	1.66992	36.25	0.003	343	-177	-12.7	3.6		2.7	Moon	TAU Atlas
2010/12/19	03:39:31	1.81500	9.75	0.003	359	152	-12.4	3.7		1.9	Moon	TAU Electra
2010/12/19	04:03:04	2.06577	5.88	0.003	359	152	-12.4	3.9		0.7	Moon	TAU Maia
2010/12/19	04:41:43	1.79651	-0.20	0.003	359	152	-12.4	2.9		1.8	Moon	Eta TAU Alcyone
2010/12/19	05:19:51	1.73664	-5.81	0.003	359	153	-12.4	3.6		1.9	Moon	TAU Atlas

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Alt = altezza in gradi sull'orizzonte dell'evento nel momento centrale

R1 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della Luna

m\* = magnitudine della stella

tm = se presente, la stella viene occultata massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di 1° tra loro

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Alt = height in ° on the horizon of the event in the central moment

R1 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the Moon

m\* = magnitude of the star

tm = if present, the star is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than 1°

# LUNA A BARCHETTA E LUNA A PONTE MOON LIKE A BOAT AND LIKE A BRIDGE

## ANCONA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
15/	2/2010	17:00	189.8	2	11	-5		
15/	2/2010	17:10	189.4	2	10	-7		
15/	2/2010	17:20	189.1	2	8	-9		
15/	2/2010	17:30	188.8	2	6	-10		
15/	2/2010	17:40	188.5	2	5	-12		
15/	2/2010	17:50	188.3	2	3	-14		
15/	2/2010	18:00	188.2	3	1	-16		
15/	2/2010	18:10	188.1	3	-0	-18		
16/	3/2010	17:40	173.1	1	4	-6		
16/	3/2010	17:50	173.5	1	2	-8		
16/	3/2010	18:00	173.9	1	1	-9		
16/	3/2010	18:10	174.3	1	-0	-11		
17/	3/2010	17:20	186.6	3	18	-2		
17/	3/2010	17:30	186.6	3	17	-4		
17/	3/2010	17:40	186.7	4	15	-6		
17/	3/2010	17:50	186.8	4	13	-7		
17/	3/2010	18:00	187.0	4	12	-9		
17/	3/2010	18:10	187.3	4	10	-11		
17/	3/2010	18:20	187.6	4	8	-13		
17/	3/2010	18:30	187.9	4	6	-14		
17/	3/2010	18:40	188.3	4	5	-16		
17/	3/2010	18:50	188.7	4	3	-18		
17/	3/2010	19:00	189.2	4	1	-20		
17/	3/2010	19:10	189.7	4	0	-21		

## AOSTA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
16/	3/2010	18:10	175.8	1	4	-7		
16/	3/2010	18:20	176.2	1	2	-8		
16/	3/2010	18:30	176.6	1	0	-10		
16/	3/2010	18:40	177.1	1	-1	-12		
17/	3/2010	17:50	189.0	4	18	-3		
17/	3/2010	18:00	189.0	4	16	-5		
17/	3/2010	18:10	189.1	4	14	-6		
17/	3/2010	18:20	189.2	4	13	-8		
17/	3/2010	18:30	189.4	4	11	-10		
17/	3/2010	18:40	189.7	4	9	-11		
15/	4/2010	18:40	189.9	2	10	-5		

## BARI

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
15/	2/2010	16:40	187.6	2	13	-3		
15/	2/2010	16:50	187.1	2	11	-5		
15/	2/2010	17:00	186.7	2	10	-7		
15/	2/2010	17:10	186.4	2	8	-9		
15/	2/2010	17:20	186.1	2	6	-11		
15/	2/2010	17:30	185.9	2	4	-13		
15/	2/2010	17:40	185.7	2	3	-15		
15/	2/2010	17:50	185.6	2	1	-16		
15/	2/2010	18:00	185.6	3	-0	-18		
16/	2/2010	17:30	189.9	6	15	-12		
16/	2/2010	17:40	189.6	6	13	-14		
16/	2/2010	17:50	189.4	6	12	-16		
16/	2/2010	18:00	189.2	6	10	-18		
16/	2/2010	18:10	189.1	6	8	-20		
16/	2/2010	18:20	189.0	6	6	-22		
16/	2/2010	18:30	189.0	6	4	-24		
16/	2/2010	18:40	189.1	6	2	-26		
16/	2/2010	18:50	189.2	6	1	-27		
16/	2/2010	19:00	189.3	7	-0	-29		
16/	3/2010	17:30	170.5	1	3	-7		
16/	3/2010	17:40	170.9	1	1	-8		
16/	3/2010	17:50	171.3	1	0	-10		
17/	3/2010	17:10	183.9	3	18	-3		
17/	3/2010	17:20	184.0	3	16	-4		
17/	3/2010	17:30	184.1	3	14	-6		
17/	3/2010	17:40	184.3	4	12	-8		
17/	3/2010	17:50	184.5	4	11	-10		
17/	3/2010	18:00	184.8	4	9	-12		
17/	3/2010	18:10	185.1	4	7	-14		

## GG MM AAAA HH MM ZABL K ALT ALT.S.

17/	3/2010	18:20	185.5	4	5	-16
17/	3/2010	18:30	185.9	4	3	-18
17/	3/2010	18:40	186.4	4	2	-19
17/	3/2010	18:50	186.9	4	0	-21
18/	3/2010	17:00	189.9	8	31	-0
18/	3/2010	17:10	189.8	8	29	-2
18/	3/2010	17:20	189.7	8	27	-4
18/	3/2010	17:30	189.7	8	25	-6
18/	3/2010	17:40	189.7	8	24	-8
18/	3/2010	17:50	189.8	8	22	-10

15/	4/2010	17:50	184.2	2	10	-4
15/	4/2010	18:00	184.9	2	8	-6
15/	4/2010	18:10	185.6	2	7	-8
15/	4/2010	18:20	186.3	2	5	-9
15/	4/2010	18:30	187.1	2	3	-11
15/	4/2010	18:40	188.0	2	2	-13
15/	4/2010	18:50	188.9	2	0	-15

12/	8/2010	6:50	350.0	7	0	31
10/	9/2010	6:50	351.4	5	-0	25
10/	9/2010	7:00	350.9	5	1	27
10/	9/2010	7:10	350.4	5	3	29

## BOLOGNA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
15/	2/2010	17:30	189.9	2	8	-9		
15/	2/2010	17:40	189.6	2	6	-11		
15/	2/2010	17:50	189.4	2	4	-13		
15/	2/2010	18:00	189.2	3	3	-14		
15/	2/2010	18:10	189.1	3	1	-16		
15/	2/2010	18:20	189.0	3	-0	-18		

16/	3/2010	17:50	174.2	1	4	-6
16/	3/2010	18:00	174.5	1	2	-8
16/	3/2010	18:10	174.9	1	1	-9
16/	3/2010	18:20	175.4	1	-0	-11

17/	3/2010	17:30	187.6	3	18	-2
17/	3/2010	17:40	187.6	4	17	-4
17/	3/2010	17:50	187.7	4	15	-6
17/	3/2010	18:00	187.8	4	13	-7
17/	3/2010	18:10	188.0	4	11	-9
17/	3/2010	18:20	188.2	4	10	-11
17/	3/2010	18:30	188.5	4	8	-13
17/	3/2010	18:40	188.8	4	6	-15
17/	3/2010	18:50	189.2	4	5	-16
17/	3/2010	19:00	189.7	4	3	-18

15/	4/2010	18:20	188.2	2	10	-4
15/	4/2010	18:30	188.9	2	8	-6
15/	4/2010	18:40	189.6	2	7	-8

## CAGLIARI

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
15/	2/2010	17:10	185.9	2	14	-3		
15/	2/2010	17:20	185.4	2	12	-5		
15/	2/2010	17:30	185.0	2	10	-7		
15/	2/2010	17:40	184.7	2	9	-8		
15/	2/2010	17:50	184.4	2	7	-10		
15/	2/2010	18:00	184.2	3	5	-12		
15/	2/2010	18:10	184.0	3	3	-14		
15/	2/2010	18:20	183.9	3	1	-16		
15/	2/2010	18:30	183.8	3	-0	-18		

16/	2/2010	17:20	189.8	6	23	-4
16/	2/2010	17:30	189.3	6	21	-6
16/	2/2010	17:40	188.8	6	19	-8
16/	2/2010	17:50	188.4	6	18	-10
16/	2/2010	18:00	188.0	6	16	-12
16/	2/2010	18:10	187.8	6	14	-14
16/	2/2010	18:20	187.5	6	12	-16
16/	2/2010	18:30	187.3	6	10	-18
16/	2/2010	18:40	187.2	6	8	-20
16/	2/2010	18:50	187.2	6	7	-22
16/	2/2010	19:00	187.2	7	5	-24
16/	2/2010	19:10	187.2	7	3	-26
16/	2/2010	19:20	187.3	7	1	-28
16/	2/2010	19:30	187.4	7	-0	-29

17/	2/2010	18:20	189.9	12	23	-16
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GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.	GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
17/ 2/2010	18:30	189.6	12	21	-18	17/ 3/2010	17:50	184.8	4	12	-8
17/ 2/2010	18:40	189.4	12	19	-20	17/ 3/2010	18:00	185.0	4	10	-10
17/ 2/2010	18:50	189.2	12	18	-22	17/ 3/2010	18:10	185.3	4	9	-12
17/ 2/2010	19:00	189.1	12	16	-24	17/ 3/2010	18:20	185.6	4	7	-14
17/ 2/2010	19:10	189.1	12	14	-25	17/ 3/2010	18:30	186.0	4	5	-16
17/ 2/2010	19:20	189.1	12	12	-27	17/ 3/2010	18:40	186.4	4	3	-18
17/ 2/2010	19:30	189.2	12	10	-29	17/ 3/2010	18:50	186.9	4	2	-19
17/ 2/2010	19:40	189.3	12	8	-31	17/ 3/2010	19:00	187.4	4	0	-21
17/ 2/2010	19:50	189.5	12	6	-33						
17/ 2/2010	20:00	189.7	12	5	-35	15/ 4/2010	18:00	184.8	2	10	-4
						15/ 4/2010	18:10	185.5	2	8	-6
17/ 3/2010	17:40	182.1	4	18	-2	15/ 4/2010	18:20	186.2	2	7	-8
17/ 3/2010	17:50	182.1	4	16	-4	15/ 4/2010	18:30	186.9	2	5	-9
17/ 3/2010	18:00	182.3	4	15	-6	15/ 4/2010	18:40	187.7	2	3	-11
17/ 3/2010	18:10	182.5	4	13	-8	15/ 4/2010	18:50	188.6	2	2	-13
17/ 3/2010	18:20	182.7	4	11	-10	15/ 4/2010	19:00	189.5	2	0	-15
17/ 3/2010	18:30	183.0	4	9	-12						
17/ 3/2010	18:40	183.3	4	7	-14	10/ 9/2010	7:00	350.9	5	-0	25
17/ 3/2010	18:50	183.7	4	5	-16	10/ 9/2010	7:10	350.4	5	1	27
17/ 3/2010	19:00	184.1	4	3	-18						
17/ 3/2010	19:10	184.6	4	2	-20						
17/ 3/2010	19:20	185.2	4	0	-22						
						CATANZARO					
18/ 3/2010	16:40	189.6	8	41	8	GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
18/ 3/2010	16:50	189.0	8	39	7	15/ 2/2010	16:40	185.4	2	14	-3
18/ 3/2010	17:00	188.6	8	37	5	15/ 2/2010	16:50	185.0	2	12	-5
18/ 3/2010	17:10	188.3	8	35	3	15/ 2/2010	17:00	184.6	2	10	-6
18/ 3/2010	17:20	188.0	8	33	1	15/ 2/2010	17:10	184.2	2	9	-8
18/ 3/2010	17:30	187.8	8	31	-0	15/ 2/2010	17:20	184.0	2	7	-10
18/ 3/2010	17:40	187.7	8	30	-2	15/ 2/2010	17:30	183.7	2	5	-12
18/ 3/2010	17:50	187.7	8	28	-4	15/ 2/2010	17:40	183.6	2	3	-14
18/ 3/2010	18:00	187.7	8	26	-6	15/ 2/2010	17:50	183.4	2	1	-16
18/ 3/2010	18:10	187.7	8	24	-8	15/ 2/2010	18:00	183.4	3	-0	-18
18/ 3/2010	18:20	187.9	8	22	-10						
18/ 3/2010	18:30	188.0	8	20	-12	GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
18/ 3/2010	18:40	188.2	8	18	-14	16/ 2/2010	16:50	189.4	6	23	-4
18/ 3/2010	18:50	188.5	8	17	-16	16/ 2/2010	17:00	188.9	6	21	-6
18/ 3/2010	19:00	188.8	8	15	-18	16/ 2/2010	17:10	188.4	6	19	-8
18/ 3/2010	19:10	189.2	8	13	-19	16/ 2/2010	17:20	188.0	6	18	-10
18/ 3/2010	19:20	189.6	8	11	-21	16/ 2/2010	17:30	187.7	6	16	-12
						16/ 2/2010	17:40	187.4	6	14	-14
15/ 4/2010	18:20	182.6	2	10	-5	16/ 2/2010	17:50	187.1	6	12	-16
15/ 4/2010	18:30	183.3	2	8	-6	16/ 2/2010	18:00	187.0	6	10	-18
15/ 4/2010	18:40	184.0	2	6	-8	16/ 2/2010	18:10	186.9	6	8	-20
15/ 4/2010	18:50	184.8	2	5	-10	16/ 2/2010	18:20	186.8	6	6	-22
15/ 4/2010	19:00	185.6	2	3	-12	16/ 2/2010	18:30	186.8	6	4	-24
15/ 4/2010	19:10	186.5	2	1	-14	16/ 2/2010	18:40	186.8	6	3	-26
15/ 4/2010	19:20	187.4	2	0	-15	16/ 2/2010	18:50	186.9	6	1	-28
						16/ 2/2010	19:00	187.1	7	-0	-30
12/ 8/2010	7:20	351.8	7	0	31						
12/ 8/2010	7:30	351.8	7	2	33	17/ 2/2010	17:40	189.9	12	25	-14
12/ 8/2010	7:40	351.6	7	3	34	17/ 2/2010	17:50	189.5	12	23	-16
12/ 8/2010	7:50	351.4	7	5	36	17/ 2/2010	18:00	189.2	12	21	-18
12/ 8/2010	8:00	351.2	7	7	38	17/ 2/2010	18:10	189.0	12	19	-20
12/ 8/2010	8:10	350.9	7	9	40	17/ 2/2010	18:20	188.9	12	17	-22
12/ 8/2010	8:20	350.6	8	11	42	17/ 2/2010	18:30	188.8	12	16	-23
12/ 8/2010	8:30	350.2	8	13	44	17/ 2/2010	18:40	188.7	12	14	-25
						17/ 2/2010	18:50	188.8	12	12	-27
10/ 9/2010	7:20	353.2	5	-0	26	17/ 2/2010	19:00	188.8	12	10	-29
10/ 9/2010	7:30	352.7	5	1	28	17/ 2/2010	19:10	188.9	12	8	-31
10/ 9/2010	7:40	352.1	6	3	29	17/ 2/2010	19:20	189.1	12	6	-33
10/ 9/2010	7:50	351.5	6	4	31	17/ 2/2010	19:30	189.3	12	4	-35
10/ 9/2010	8:00	350.9	6	6	33	17/ 2/2010	19:40	189.6	12	2	-37
10/ 9/2010	8:10	350.2	6	8	35	17/ 2/2010	19:50	190.0	12	1	-39
CAMPOBASSO						17/ 3/2010	17:10	181.6	3	18	-2
GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.	17/ 3/2010	17:20	181.7	3	16	-4
15/ 2/2010	16:40	188.5	2	15	-2	17/ 3/2010	17:30	181.8	3	14	-6
15/ 2/2010	16:50	188.0	2	13	-4	17/ 3/2010	17:40	182.0	4	12	-8
15/ 2/2010	17:00	187.6	2	11	-5	17/ 3/2010	17:50	182.2	4	11	-10
15/ 2/2010	17:10	187.2	2	9	-7	17/ 3/2010	18:00	182.5	4	9	-12
15/ 2/2010	17:20	186.8	2	8	-9	17/ 3/2010	18:10	182.9	4	7	-14
15/ 2/2010	17:30	186.6	2	6	-11	17/ 3/2010	18:20	183.3	4	5	-16
15/ 2/2010	17:40	186.4	2	4	-13	17/ 3/2010	18:30	183.7	4	3	-18
15/ 2/2010	17:50	186.2	2	2	-15	17/ 3/2010	18:40	184.2	4	1	-20
15/ 2/2010	18:00	186.1	3	1	-17	17/ 3/2010	18:50	184.7	4	0	-22
15/ 2/2010	18:10	186.0	3	-0	-19						
						18/ 3/2010	16:00	189.6	8	42	10
16/ 2/2010	18:00	189.8	6	11	-16	18/ 3/2010	16:10	189.0	8	40	9
16/ 2/2010	18:10	189.6	6	10	-18	18/ 3/2010	16:20	188.5	8	39	7
16/ 2/2010	18:20	189.5	6	8	-20	18/ 3/2010	16:30	188.1	8	37	5
16/ 2/2010	18:30	189.5	6	6	-22	18/ 3/2010	16:40	187.8	8	35	3
16/ 2/2010	18:40	189.5	6	4	-24	18/ 3/2010	16:50	187.5	8	33	1
16/ 2/2010	18:50	189.5	6	2	-26	18/ 3/2010	17:00	187.4	8	31	-0
16/ 2/2010	19:00	189.6	7	1	-28	18/ 3/2010	17:10	187.3	8	29	-2
16/ 2/2010	19:10	189.8	7	-0	-29	18/ 3/2010	17:20	187.2	8	27	-4
16/ 3/2010	17:40	171.1	1	3	-7	18/ 3/2010	17:30	187.2	8	26	-6
16/ 3/2010	17:50	171.5	1	1	-9	18/ 3/2010	17:40	187.3	8	24	-8
16/ 3/2010	18:00	172.0	1	-0	-10	18/ 3/2010	17:50	187.4	8	22	-10
						18/ 3/2010	18:00	187.6	8	20	-12
17/ 3/2010	17:20	184.4	3	18	-3	18/ 3/2010	18:10	187.8	8	18	-14
17/ 3/2010	17:30	184.5	3	16	-5	18/ 3/2010	18:20	188.1	8	16	-16
17/ 3/2010	17:40	184.6	4	14	-7	18/ 3/2010	18:30	188.4	8	14	-18
						18/ 3/2010	18:40	188.8	8	13	-20



GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
18/ 3/2010	18:50	189.2	8	11	-21
18/ 3/2010	19:00	189.7	8	9	-23
15/ 4/2010	17:50	182.0	2	10	-5
15/ 4/2010	18:00	182.7	2	8	-6
15/ 4/2010	18:10	183.4	2	6	-8
15/ 4/2010	18:20	184.2	2	4	-10
15/ 4/2010	18:30	185.0	2	3	-12
15/ 4/2010	18:40	185.9	2	1	-14
15/ 4/2010	18:50	186.8	2	-0	-15

16/ 4/2010	15:40	189.9	5	45	20
16/ 4/2010	15:50	189.7	5	43	18
16/ 4/2010	16: 0	189.5	5	41	16
16/ 4/2010	16:10	189.4	5	40	14
16/ 4/2010	16:20	189.4	5	38	12
16/ 4/2010	16:30	189.4	5	36	10
16/ 4/2010	16:40	189.5	5	34	8
16/ 4/2010	16:50	189.7	5	32	6
16/ 4/2010	17:00	189.9	5	30	4

12/ 8/2010	6:50	352.2	7	0	31
12/ 8/2010	7:00	352.1	7	2	33
12/ 8/2010	7:10	352.0	7	4	34
12/ 8/2010	7:20	351.8	7	6	36
12/ 8/2010	7:30	351.6	7	7	38
12/ 8/2010	7:40	351.3	7	9	40
12/ 8/2010	7:50	350.9	7	11	42
12/ 8/2010	8:00	350.5	7	13	44
12/ 8/2010	8:10	350.1	7	15	46

10/ 9/2010	6:50	353.6	5	-0	26
10/ 9/2010	7:00	353.1	5	1	28
10/ 9/2010	7:10	352.6	5	3	30
10/ 9/2010	7:20	352.0	5	5	31
10/ 9/2010	7:30	351.3	5	7	33
10/ 9/2010	7:40	350.6	6	8	35

#### FIRENZE

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
15/ 2/2010	17:10	189.9	2	11	-5
15/ 2/2010	17:20	189.5	2	10	-7
15/ 2/2010	17:30	189.2	2	8	-9
15/ 2/2010	17:40	188.9	2	6	-11
15/ 2/2010	17:50	188.7	2	5	-12
15/ 2/2010	18:00	188.5	3	3	-14
15/ 2/2010	18:10	188.4	3	1	-16
15/ 2/2010	18:20	188.3	3	-0	-18

16/ 3/2010	17:50	173.4	1	4	-6
16/ 3/2010	18:00	173.8	1	2	-8
16/ 3/2010	18:10	174.2	1	1	-10
16/ 3/2010	18:20	174.7	1	-0	-11

17/ 3/2010	17:30	186.8	3	18	-2
17/ 3/2010	17:40	186.8	4	17	-4
17/ 3/2010	17:50	186.9	4	15	-6
17/ 3/2010	18:00	187.0	4	13	-8
17/ 3/2010	18:10	187.2	4	11	-9
17/ 3/2010	18:20	187.5	4	10	-11
17/ 3/2010	18:30	187.8	4	8	-13
17/ 3/2010	18:40	188.1	4	6	-15
17/ 3/2010	18:50	188.5	4	5	-16
17/ 3/2010	19:00	188.9	4	3	-18
17/ 3/2010	19:10	189.4	4	1	-20

15/ 4/2010	18:20	187.5	2	10	-5
15/ 4/2010	18:30	188.2	2	8	-6
15/ 4/2010	18:40	188.9	2	6	-8
15/ 4/2010	18:50	189.6	2	5	-10

#### GENOVA

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
15/ 2/2010	17:40	189.9	2	8	-9
15/ 2/2010	17:50	189.6	2	6	-11
15/ 2/2010	18:00	189.4	3	4	-13
15/ 2/2010	18:10	189.2	3	3	-14
15/ 2/2010	18:20	189.1	3	1	-16
15/ 2/2010	18:30	189.0	3	-0	-18

16/ 3/2010	18:00	174.3	1	4	-6
16/ 3/2010	18:10	174.6	1	2	-8
16/ 3/2010	18:20	175.1	1	1	-10
16/ 3/2010	18:30	175.5	1	-0	-11

17/ 3/2010	17:40	187.6	4	18	-2
17/ 3/2010	17:50	187.6	4	17	-4
17/ 3/2010	18:00	187.7	4	15	-6
17/ 3/2010	18:10	187.8	4	13	-8
17/ 3/2010	18:20	188.0	4	11	-9
17/ 3/2010	18:30	188.2	4	10	-11

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
17/ 3/2010	18:40	188.5	4	8	-13
17/ 3/2010	18:50	188.8	4	6	-15
17/ 3/2010	19:00	189.2	4	5	-16
17/ 3/2010	19:10	189.7	4	3	-18
15/ 4/2010	18:30	188.3	2	10	-5
15/ 4/2010	18:40	188.9	2	8	-6
15/ 4/2010	18:50	189.6	2	7	-8

#### L AQUILA

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
15/ 2/2010	16:50	189.1	2	14	-3
15/ 2/2010	17:00	188.6	2	12	-5
15/ 2/2010	17:10	188.2	2	10	-7
15/ 2/2010	17:20	187.8	2	8	-8
15/ 2/2010	17:30	187.5	2	7	-10
15/ 2/2010	17:40	187.3	2	5	-12
15/ 2/2010	17:50	187.1	2	3	-14
15/ 2/2010	18:00	186.9	3	1	-16
15/ 2/2010	18:10	186.9	3	0	-18

16/ 3/2010	17:40	171.8	1	4	-6
16/ 3/2010	17:50	172.2	1	2	-8
16/ 3/2010	18:00	172.6	1	0	-9
16/ 3/2010	18:10	173.1	1	-0	-11

17/ 3/2010	17:20	185.3	3	19	-2
17/ 3/2010	17:30	185.3	3	17	-4
17/ 3/2010	17:40	185.4	4	15	-6
17/ 3/2010	17:50	185.5	4	13	-7
17/ 3/2010	18:00	185.7	4	12	-9
17/ 3/2010	18:10	186.0	4	10	-11
17/ 3/2010	18:20	186.3	4	8	-13
17/ 3/2010	18:30	186.6	4	6	-15
17/ 3/2010	18:40	187.0	4	4	-16
17/ 3/2010	18:50	187.5	4	3	-18
17/ 3/2010	19:00	188.0	4	1	-20
17/ 3/2010	19:10	188.5	4	-0	-22

15/ 4/2010	18:10	186.0	2	9	-5
15/ 4/2010	18:20	186.6	2	8	-7
15/ 4/2010	18:30	187.4	2	6	-8
15/ 4/2010	18:40	188.1	2	4	-10
15/ 4/2010	18:50	188.9	2	3	-12
15/ 4/2010	19:00	189.8	2	1	-13

#### MILANO

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
16/ 3/2010	18:00	175.3	1	4	-6
16/ 3/2010	18:10	175.7	1	2	-8
16/ 3/2010	18:20	176.1	1	1	-10
16/ 3/2010	18:30	176.6	1	-0	-11

17/ 3/2010	17:40	188.6	4	18	-2
17/ 3/2010	17:50	188.7	4	16	-4
17/ 3/2010	18:00	188.7	4	15	-6
17/ 3/2010	18:10	188.9	4	13	-8
17/ 3/2010	18:20	189.0	4	11	-9
17/ 3/2010	18:30	189.3	4	10	-11
17/ 3/2010	18:40	189.6	4	8	-13
17/ 3/2010	18:50	189.9	4	6	-15

15/ 4/2010	18:30	189.4	2	10	-4
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#### NAPOLI

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
15/ 2/2010	16:50	187.4	2	13	-3
15/ 2/2010	17:00	186.9	2	12	-5
15/ 2/2010	17:10	186.5	2	10	-7
15/ 2/2010	17:20	186.2	2	8	-9
15/ 2/2010	17:30	185.9	2	6	-11
15/ 2/2010	17:40	185.7	2	5	-13
15/ 2/2010	17:50	185.5	2	3	-14
15/ 2/2010	18:00	185.4	3	1	-16
15/ 2/2010	18:10	185.3	3	-0	-18

16/ 2/2010	17:40	189.7	6	15	-12
16/ 2/2010	17:50	189.4	6	14	-14
16/ 2/2010	18:00	189.1	6	12	-16
16/ 2/2010	18:10	189.0	6	10	-18
16/ 2/2010	18:20	188.8	6	8	-20
16/ 2/2010	18:30	188.8	6	6	-22
16/ 2/2010	18:40	188.8	6	4	-24
16/ 2/2010	18:50	188.8	6	3	-26
16/ 2/2010	19:00	188.9	7	1	-27
16/ 2/2010	19:10	189.0	7	-0	-29

16/ 3/2010	17:40	170.4	1	3	-6
16/ 3/2010	17:50	170.8	1	1	-8
16/ 3/2010	18:00	171.2	1	0	-10

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.	GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
17/ 3/2010	17:20	183.7	3	18	-2	17/ 3/2010	17:20	180.8	3	19	-2
17/ 3/2010	17:30	183.8	3	16	-4	17/ 3/2010	17:30	180.9	3	17	-4
17/ 3/2010	17:40	183.9	4	14	-6	17/ 3/2010	17:40	181.0	4	15	-6
17/ 3/2010	17:50	184.0	4	13	-8	17/ 3/2010	17:50	181.2	4	13	-8
17/ 3/2010	18:00	184.3	4	11	-10	17/ 3/2010	18:00	181.4	4	11	-10
17/ 3/2010	18:10	184.5	4	9	-12	17/ 3/2010	18:10	181.7	4	9	-12
17/ 3/2010	18:20	184.9	4	7	-14	17/ 3/2010	18:20	182.1	4	7	-14
17/ 3/2010	18:30	185.3	4	5	-16	17/ 3/2010	18:30	182.4	4	5	-16
17/ 3/2010	18:40	185.7	4	4	-17	17/ 3/2010	18:40	182.9	4	4	-17
17/ 3/2010	18:50	186.2	4	2	-19	17/ 3/2010	18:50	183.4	4	2	-19
17/ 3/2010	19:00	186.7	4	0	-21	17/ 3/2010	19:00	183.9	4	0	-21
18/ 3/2010	17:00	189.9	8	33	1	18/ 3/2010	16:00	189.6	8	45	13
18/ 3/2010	17:10	189.7	8	31	-0	18/ 3/2010	16:10	188.9	8	43	11
18/ 3/2010	17:20	189.5	8	29	-2	18/ 3/2010	16:20	188.3	8	41	9
18/ 3/2010	17:30	189.4	8	27	-4	18/ 3/2010	16:30	187.7	8	39	7
18/ 3/2010	17:40	189.4	8	26	-6	18/ 3/2010	16:40	187.3	8	38	5
18/ 3/2010	17:50	189.5	8	24	-8	18/ 3/2010	16:50	187.0	8	36	3
18/ 3/2010	18:00	189.6	8	22	-10	18/ 3/2010	17:00	186.7	8	34	1
18/ 3/2010	18:10	189.7	8	20	-12	18/ 3/2010	17:10	186.5	8	32	-0
18/ 3/2010	18:20	189.9	8	18	-14	18/ 3/2010	17:20	186.4	8	30	-2
15/ 4/2010	18:00	184.0	2	10	-4	18/ 3/2010	17:30	186.4	8	28	-4
15/ 4/2010	18:10	184.7	2	8	-6	18/ 3/2010	17:40	186.4	8	26	-6
15/ 4/2010	18:20	185.4	2	7	-8	18/ 3/2010	17:50	186.5	8	24	-8
15/ 4/2010	18:30	186.2	2	5	-9	18/ 3/2010	18:00	186.6	8	22	-10
15/ 4/2010	18:40	187.0	2	3	-11	18/ 3/2010	18:10	186.8	8	21	-11
15/ 4/2010	18:50	187.8	2	2	-13	18/ 3/2010	18:20	187.0	8	19	-13
15/ 4/2010	19:00	188.7	2	0	-15	18/ 3/2010	18:30	187.3	8	17	-15
12/ 8/2010	7:00	350.2	7	0	31	18/ 3/2010	18:40	187.6	8	15	-17
12/ 8/2010	7:10	350.1	7	2	32	18/ 3/2010	18:50	188.0	8	13	-19
12/ 8/2010	7:20	350.0	7	4	34	18/ 3/2010	19:00	188.4	8	11	-21
10/ 9/2010	7:00	351.6	5	-0	25	18/ 3/2010	19:10	188.8	8	9	-23
10/ 9/2010	7:10	351.1	5	1	27	18/ 3/2010	19:20	189.3	8	8	-25
10/ 9/2010	7:20	350.6	5	2	29	18/ 3/2010	19:30	189.9	8	6	-27
10/ 9/2010	7:30	350.0	5	4	31	15/ 4/2010	18:00	181.2	2	10	-4
PALERMO						15/ 4/2010	18:10	181.9	2	8	-6
GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.	15/ 4/2010	18:20	182.6	2	6	-8
15/ 2/2010	16:50	184.9	2	15	-2	15/ 4/2010	18:30	183.4	2	5	-10
15/ 2/2010	17:00	184.4	2	13	-4	15/ 4/2010	18:40	184.2	2	3	-12
15/ 2/2010	17:10	184.0	2	11	-6	15/ 4/2010	18:50	185.1	2	1	-13
15/ 2/2010	17:20	183.6	2	9	-8	15/ 4/2010	19:00	186.0	2	-0	-15
15/ 2/2010	17:30	183.3	2	7	-10	16/ 4/2010	15:30	189.8	5	50	24
15/ 2/2010	17:40	183.1	2	6	-12	16/ 4/2010	15:40	189.3	5	48	22
15/ 2/2010	17:50	182.9	2	4	-14	16/ 4/2010	15:50	189.0	5	46	20
15/ 2/2010	18:00	182.7	3	2	-15	16/ 4/2010	16:00	188.7	5	44	18
15/ 2/2010	18:10	182.7	3	0	-17	16/ 4/2010	16:10	188.6	5	42	16
16/ 2/2010	16:50	189.5	6	26	-2	16/ 4/2010	16:20	188.5	5	40	14
16/ 2/2010	17:00	188.8	6	24	-4	16/ 4/2010	16:30	188.5	5	38	12
16/ 2/2010	17:10	188.3	6	22	-6	16/ 4/2010	16:40	188.5	5	37	10
16/ 2/2010	17:20	187.8	6	20	-7	16/ 4/2010	16:50	188.6	5	35	9
16/ 2/2010	17:30	187.4	6	18	-9	16/ 4/2010	17:00	188.8	5	33	7
16/ 2/2010	17:40	187.0	6	16	-11	16/ 4/2010	17:10	189.0	5	31	5
16/ 2/2010	17:50	186.7	6	15	-13	16/ 4/2010	17:20	189.3	5	29	3
16/ 2/2010	18:00	186.5	6	13	-15	16/ 4/2010	17:30	189.7	5	27	1
16/ 2/2010	18:10	186.3	6	11	-17	14/ 5/2010	18:40	189.9	1	2	-6
16/ 2/2010	18:20	186.1	6	9	-19	12/ 8/2010	7:00	353.0	7	-0	30
16/ 2/2010	18:30	186.1	6	7	-21	12/ 8/2010	7:10	352.9	7	1	32
16/ 2/2010	18:40	186.0	6	5	-23	12/ 8/2010	7:20	352.8	7	3	34
16/ 2/2010	18:50	186.1	6	3	-25	12/ 8/2010	7:30	352.6	7	5	36
16/ 2/2010	19:00	186.2	7	1	-27	12/ 8/2010	7:40	352.4	7	7	38
16/ 2/2010	19:10	186.3	7	-0	-29	12/ 8/2010	7:50	352.1	7	9	40
17/ 2/2010	17:40	189.6	12	27	-11	12/ 8/2010	8:00	351.8	7	11	42
17/ 2/2010	17:50	189.1	12	26	-13	12/ 8/2010	8:10	351.4	7	12	44
17/ 2/2010	18:00	188.8	12	24	-15	12/ 8/2010	8:20	351.0	8	14	46
17/ 2/2010	18:10	188.5	12	22	-17	12/ 8/2010	8:30	350.5	8	16	47
17/ 2/2010	18:20	188.3	12	20	-19	13/ 8/2010	8:10	350.2	15	-0	43
17/ 2/2010	18:30	188.1	12	18	-21	10/ 9/2010	7:00	354.4	5	-0	26
17/ 2/2010	18:40	188.0	12	16	-23	10/ 9/2010	7:10	353.9	5	1	27
17/ 2/2010	18:50	188.0	12	14	-25	10/ 9/2010	7:20	353.4	5	3	29
17/ 2/2010	19:00	188.0	12	12	-27	10/ 9/2010	7:30	352.8	5	4	31
17/ 2/2010	19:10	188.0	12	10	-29	10/ 9/2010	7:40	352.2	6	6	33
17/ 2/2010	19:20	188.1	12	9	-31	10/ 9/2010	7:50	351.5	6	8	35
17/ 2/2010	19:30	188.3	12	7	-33	10/ 9/2010	8:00	350.8	6	10	37
17/ 2/2010	19:40	188.5	12	5	-35	10/ 9/2010	8:10	350.0	6	11	38
17/ 2/2010	19:50	188.8	12	3	-37	PERUGIA					
17/ 2/2010	20:00	189.1	12	1	-38	GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
17/ 2/2010	20:10	189.5	12	-0	-40	15/ 2/2010	17:00	189.5	2	12	-4
18/ 2/2010	18:40	189.9	19	27	-23	15/ 2/2010	17:10	189.1	2	11	-6
18/ 2/2010	18:50	189.8	19	25	-25	15/ 2/2010	17:20	188.7	2	9	-8
18/ 2/2010	19:00	189.7	19	24	-27	15/ 2/2010	17:30	188.4	2	7	-10
18/ 2/2010	19:10	189.7	19	22	-29	15/ 2/2010	17:40	188.1	2	6	-11
18/ 2/2010	19:20	189.7	19	20	-31	15/ 2/2010	17:50	187.9	2	4	-13
18/ 2/2010	19:30	189.8	19	18	-33	15/ 2/2010	18:00	187.8	3	2	-15
18/ 2/2010	19:40	189.9	19	16	-34	15/ 2/2010	18:10	187.7	3	0	-17
						15/ 2/2010	18:20	187.6	3	-1	-19

GG MM AAAA HH MM ZABL K ALT ALT.S.

16/ 3/2010	17:50	172.9	1	3	-7
16/ 3/2010	18:00	173.3	1	1	-9
16/ 3/2010	18:10	173.7	1	0	-10
17/ 3/2010	17:30	186.1	3	18	-3
17/ 3/2010	17:40	186.2	4	16	-5
17/ 3/2010	17:50	186.3	4	14	-7
17/ 3/2010	18:00	186.4	4	12	-8
17/ 3/2010	18:10	186.7	4	11	-10
17/ 3/2010	18:20	186.9	4	9	-12
17/ 3/2010	18:30	187.2	4	7	-14
17/ 3/2010	18:40	187.6	4	5	-16
17/ 3/2010	18:50	188.0	4	4	-17
17/ 3/2010	19:00	188.5	4	2	-19
17/ 3/2010	19:10	189.0	4	0	-21
17/ 3/2010	19:20	189.6	4	-1	-23
15/ 4/2010	18:10	186.5	2	10	-4
15/ 4/2010	18:20	187.1	2	9	-6
15/ 4/2010	18:30	187.8	2	7	-7
15/ 4/2010	18:40	188.6	2	5	-9
15/ 4/2010	18:50	189.3	2	4	-11

# POTENZA

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
15/ 2/2010	16:40	187.3	2	14	-2
15/ 2/2010	16:50	186.9	2	12	-4
15/ 2/2010	17:00	186.4	2	11	-6
15/ 2/2010	17:10	186.1	2	9	-8
15/ 2/2010	17:20	185.8	2	7	-10
15/ 2/2010	17:30	185.5	2	5	-12
15/ 2/2010	17:40	185.3	2	3	-14
15/ 2/2010	17:50	185.2	2	2	-16
15/ 2/2010	18:00	185.1	3	0	-17
16/ 2/2010	17:20	189.9	6	18	-10
16/ 2/2010	17:30	189.6	6	16	-12
16/ 2/2010	17:40	189.2	6	14	-13
16/ 2/2010	17:50	189.0	6	12	-15
16/ 2/2010	18:00	188.8	6	11	-17
16/ 2/2010	18:10	188.7	6	9	-19
16/ 2/2010	18:20	188.6	6	7	-21
16/ 2/2010	18:30	188.5	6	5	-23
16/ 2/2010	18:40	188.6	6	3	-25
16/ 2/2010	18:50	188.6	6	1	-27
16/ 2/2010	19:00	188.8	7	0	-29
16/ 3/2010	17:40	170.3	1	2	-8
16/ 3/2010	17:50	170.7	1	0	-10
17/ 3/2010	17:10	183.4	3	19	-2
17/ 3/2010	17:20	183.5	3	17	-4
17/ 3/2010	17:30	183.6	3	15	-6
17/ 3/2010	17:40	183.7	4	13	-7
17/ 3/2010	17:50	183.9	4	11	-9
17/ 3/2010	18:00	184.2	4	10	-11
17/ 3/2010	18:10	184.5	4	8	-13
17/ 3/2010	18:20	184.9	4	6	-15
17/ 3/2010	18:30	185.3	4	4	-17
17/ 3/2010	18:40	185.7	4	2	-19
17/ 3/2010	18:50	186.2	4	1	-20
17/ 3/2010	19:00	186.8	4	-0	-22
18/ 3/2010	16:50	189.7	8	33	1
18/ 3/2010	17:00	189.5	8	32	-0
18/ 3/2010	17:10	189.3	8	30	-2
18/ 3/2010	17:20	189.2	8	28	-3
18/ 3/2010	17:30	189.2	8	26	-5
18/ 3/2010	17:40	189.2	8	24	-7
18/ 3/2010	17:50	189.3	8	23	-9
18/ 3/2010	18:00	189.4	8	21	-11
18/ 3/2010	18:10	189.6	8	19	-13
18/ 3/2010	18:20	189.8	8	17	-15
15/ 4/2010	18:00	184.2	2	9	-5
15/ 4/2010	18:10	184.9	2	7	-7
15/ 4/2010	18:20	185.6	2	6	-9
15/ 4/2010	18:30	186.4	2	4	-11
15/ 4/2010	18:40	187.2	2	2	-12
15/ 4/2010	18:50	188.1	2	0	-14
15/ 4/2010	19:00	189.0	2	-0	-16
12/ 8/2010	6:50	350.5	7	-0	30
12/ 8/2010	7:00	350.4	7	1	32
12/ 8/2010	7:10	350.3	7	3	34
12/ 8/2010	7:20	350.1	7	5	35
10/ 9/2010	7:00	351.6	5	0	27
10/ 9/2010	7:10	351.0	5	2	28
10/ 9/2010	7:20	350.5	5	4	30

# ROMA

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
15/ 2/2010	16:50	188.8	2	14	-2
15/ 2/2010	17:00	188.3	2	13	-4
15/ 2/2010	17:10	187.9	2	11	-6
15/ 2/2010	17:20	187.5	2	9	-8
15/ 2/2010	17:50	186.7	2	4	-13
15/ 2/2010	18:00	186.6	3	2	-15
15/ 2/2010	18:10	186.5	3	0	-17
15/ 2/2010	18:20	186.4	3	-1	-19
16/ 2/2010	18:30	189.9	6	8	-20
16/ 2/2010	18:40	189.9	6	6	-22
16/ 2/2010	18:50	189.9	6	4	-24
16/ 2/2010	19:00	189.9	7	2	-26
16/ 3/2010	17:50	171.7	1	3	-7
16/ 3/2010	18:00	172.1	1	1	-9
16/ 3/2010	18:10	172.5	1	-0	-11
17/ 3/2010	17:30	184.9	3	18	-3
17/ 3/2010	17:40	184.9	4	16	-5
17/ 3/2010	17:50	185.1	4	14	-7
17/ 3/2010	18:00	185.2	4	12	-9
17/ 3/2010	18:10	185.5	4	10	-10
17/ 3/2010	18:20	185.7	4	9	-12
17/ 3/2010	18:30	186.1	4	7	-14
17/ 3/2010	18:40	186.5	4	5	-16
17/ 3/2010	18:50	186.9	4	3	-18
17/ 3/2010	19:00	187.4	4	2	-20
17/ 3/2010	19:10	187.9	4	0	-21
15/ 4/2010	18:10	185.3	2	10	-4
15/ 4/2010	18:20	186.0	2	8	-6
15/ 4/2010	18:30	186.7	2	7	-8
15/ 4/2010	18:40	187.5	2	5	-10
15/ 4/2010	18:50	188.3	2	3	-11
15/ 4/2010	19:00	189.1	2	2	-13
10/ 9/2010	7:10	350.4	5	-0	26

# TORINO

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
15/ 2/2010	18:10	189.9	3	4	-14
15/ 2/2010	18:20	189.8	3	2	-15
15/ 2/2010	18:30	189.7	3	0	-17
16/ 3/2010	18:10	175.2	1	3	-7
16/ 3/2010	18:20	175.6	1	2	-9
16/ 3/2010	18:30	176.0	1	0	-10
17/ 3/2010	17:50	188.3	4	17	-3
17/ 3/2010	18:00	188.3	4	16	-5
17/ 3/2010	18:10	188.4	4	14	-7
17/ 3/2010	18:20	188.6	4	12	-8
17/ 3/2010	18:30	188.8	4	11	-10
17/ 3/2010	18:40	189.0	4	9	-12
17/ 3/2010	18:50	189.3	4	7	-14
17/ 3/2010	19:00	189.7	4	6	-15
15/ 4/2010	18:40	189.3	2	9	-5

# TRENTO

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
16/ 3/2010	17:50	175.7	1	4	-6
16/ 3/2010	18:00	176.1	1	3	-7
16/ 3/2010	18:10	176.5	1	1	-9
16/ 3/2010	18:20	176.9	1	-0	-11
17/ 3/2010	17:30	189.2	3	18	-2
17/ 3/2010	17:40	189.2	4	17	-4
17/ 3/2010	17:50	189.3	4	15	-5
17/ 3/2010	18:00	189.4	4	13	-7
17/ 3/2010	18:10	189.6	4	12	-9
17/ 3/2010	18:20	189.8	4	10	-11
15/ 4/2010	18:20	189.7	2	10	-4

# TRIESTE

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
16/ 3/2010	17:40	175.1	1	4	-6
16/ 3/2010	17:50	175.5	1	2	-8
16/ 3/2010	18:00	175.9	1	1	-9
16/ 3/2010	18:10	176.4	1	-0	-11
17/ 3/2010	17:20	188.7	3	18	-2
17/ 3/2010	17:30	188.7	3	17	-4
17/ 3/2010	17:40	188.8	4	15	-6
17/ 3/2010	17:50	188.9	4	13	-7
17/ 3/2010	18:00	189.1	4	12	-9
17/ 3/2010	18:10	189.3	4	10	-11

GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.		GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.
17/ 3/2010	18:20	189.6	4	8	-12		17/ 3/2010	17:40	188.6	4	16	-5
17/ 3/2010	18:30	189.9	4	7	-14		17/ 3/2010	17:50	188.7	4	14	-6
							17/ 3/2010	18:00	188.8	4	13	-8
15/ 4/2010	18:10	189.2	2	10	-4		17/ 3/2010	18:10	189.0	4	11	-10
15/ 4/2010	18:20	189.9	2	9	-6		17/ 3/2010	18:20	189.3	4	9	-12
							17/ 3/2010	18:30	189.6	4	7	-13
							17/ 3/2010	18:40	189.9	4	6	-15
VENEZIA							15/ 4/2010	18:20	189.4	2	9	-5
GG MM AAAA	HH MM	ZABL	K	ALT	ALT.S.		25/ 4/2009	18:45	180.4	1	2	-7
16/ 3/2010	17:50	175.2	1	3	-7		25/ 4/2009	19:00	182.1	1	0	-9
16/ 3/2010	18:00	175.6	1	2	-8							
16/ 3/2010	18:10	176.0	1	0	-10							
17/ 3/2010	17:30	188.6	3	18	-3							

Si definisce "luna a barchetta" quel curioso aspetto in cui la Luna al tramonto o all'alba appare sottile e con le cuspidi rivolte verso l'alto alla stessa altezza. La "luna a ponte" è il fenomeno opposto, con la Luna con le cuspidi rivolte verso il basso.

Ore in T.U.

ZABL = angolo zenitale del lembo illuminato della Luna, in °, nel range  $350^{\circ} < \text{ZABL} < 10^{\circ}$  e  $170^{\circ} < \text{ZABL} < 190^{\circ}$ . Se l'angolo ZABL è prossimo a  $180^{\circ}$  si ha la Luna "a barchetta", se è prossimo a  $0^{\circ}$  si ha la luna "a ponte".

K = percentuale di Luna illuminata

ALT = altezza della Luna sull'orizzonte, in °

ALT.S. = altezza del Sole sull'orizzonte, in °

It is a "small boat Moon" that curious aspect in which the Moon at the sunset or at the dawn appears thin and with the cuspidis turned upward to the same height. The "Moon like a bridge" is the opposite phenomenon, with the Moon with the cuspidis turned downward.

Times in U.T.

ZABL = zenital angle of the bright lunar limb, in °, in a range  $350^{\circ} < \text{ZABL} < 10^{\circ}$  and  $170^{\circ} < \text{ZABL} < 190^{\circ}$ . If the angle ZABL is near  $180^{\circ}$  the Moon is like a boat, if is near  $0^{\circ}$  is "like a bridge".

K = percentage of illuminated Moon

ALT = height of the Moon above the horizon, in °

ALT.S. = height of the Sun above the horizon, in °

# LUNA IN PIEDI - STANDING MOON

## ANCONA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
-----								

## AOSTA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
9/10/2010			15:40		267.3	5	14	12
9/10/2010			15:50		266.0	5	13	10

## BARI

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
-----								

## BOLOGNA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
9/10/2010			15:30		265.6	5	14	11

## CAGLIARI

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
-----								

## CAMPOBASSO

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
-----								

## CATANZARO

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
-----								

## FIRENZE

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
9/10/2010			15:30		265.2	5	15	11

## GENOVA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
9/10/2010			15:40		265.5	5	14	11

## L AQUILA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
-----								

## MILANO

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
9/10/2010			15:30		267.5	5	15	12
9/10/2010			15:40		266.1	5	14	11

## NAPOLI

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
-----								

## PALERMO

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
-----								

## PERUGIA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
-----								

## POTENZA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
-----								

## ROMA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
-----								

## TORINO

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
9/10/2010			15:40		266.7	5	15	12
9/10/2010			15:50		265.3	5	13	10

## TRENTO

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
10/ 9/2010			16:30		265.7	8	15	10
9/10/2010			15:20		268.2	5	15	12
9/10/2010			15:30		266.9	5	13	11
9/10/2010			15:40		265.6	5	12	9

## TRIESTE

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
9/10/2010			15:10		267.9	5	15	12
9/10/2010			15:20		266.5	5	14	11
9/10/2010			15:30		265.2	5	12	9

## VENEZIA

GG	MM	AAAA	HH	MM	ZABL	K	ALT	ALT.S.
9/10/2010			15:20		267.1	5	14	12
9/10/2010			15:30		265.8	5	13	10

Si definisce "luna in piedi" il fenomeno in cui la Luna al tramonto o all'alba appare con le cuspidi allineate in verticale rispetto all'orizzonte dell'osservatore.

Ore in T.U.

ZABL = angolo zenitale del lembo illuminato della Luna, in °, nel range 85°<ZABL<95° e 265°<ZABL<275°.

K = percentuale di Luna illuminata

ALT = altezza della Luna sull'orizzonte, in °

ALT.S. = altezza del Sole sull'orizzonte, in °

NB: sono visualizzati solo i giorni in cui la Luna è in piedi vicino all'orizzonte, ossia con altezza inferiore a 15°

It is "standing Moon" the phenomenon in which the Moon at the setting or at the dawn appears with the cuspidis lined up in vertical in comparison to the horizon of the observer.

Times in U.T.

ZABL = zenital angle of the bright lunar limb, in °, in a range 85°<ZABL<95° and 265°<ZABL<275°.

K = percentage of illuminated Moon

ALT = height of the Moon above the horizon, in °

ALT.S. = height of the Sun above the horizon, in °

NB: are listed only the events when the Moon is standing next to the horizon, or rather with an height inferior to 15°

# ASTEROIDI CON $m < 9$ – ASTEROIDS WITH $MAG < 9$

1 Ceres

Date			R.A.2000		Decl.2000		Delta	r	Phase	Mag	Elong.
year	mo	day	hh	mm.mm	dd	pp.p	A.U.	A.U.	°	V	°
2010	1	1	16	12.91	-17	6.5	3.438	2.706	12.4	9.0	36.1W
2010	1	2	16	14.55	-17	11.9	3.431	2.707	12.5	9.0	36.7W
2010	1	3	16	16.18	-17	17.3	3.423	2.708	12.7	9.0	37.3W
2010	1	4	16	17.81	-17	22.5	3.416	2.708	12.9	9.0	37.9W
2010	1	5	16	19.44	-17	27.7	3.408	2.709	13.1	9.0	38.5W
2010	1	6	16	21.07	-17	32.8	3.401	2.710	13.2	9.0	39.1W
2010	1	7	16	22.69	-17	37.9	3.393	2.711	13.4	9.0	39.8W
2010	1	8	16	24.31	-17	42.8	3.385	2.712	13.6	9.0	40.4W
2010	1	9	16	25.93	-17	47.7	3.377	2.712	13.8	9.0	41.0W
2010	1	10	16	27.54	-17	52.6	3.369	2.713	13.9	9.0	41.6W
2010	1	11	16	29.14	-17	57.3	3.360	2.714	14.1	9.0	42.2W
2010	1	12	16	30.75	-18	2.0	3.352	2.715	14.3	9.0	42.9W
2010	1	13	16	32.34	-18	6.6	3.343	2.716	14.4	9.0	43.5W
2010	1	14	16	33.94	-18	11.1	3.335	2.717	14.6	9.0	44.1W
2010	1	15	16	35.52	-18	15.6	3.326	2.717	14.8	9.0	44.8W
2010	1	16	16	37.11	-18	20.0	3.317	2.718	14.9	9.0	45.4W
2010	1	17	16	38.69	-18	24.3	3.308	2.719	15.1	9.0	46.0W
2010	1	18	16	40.26	-18	28.6	3.299	2.720	15.3	9.0	46.7W
2010	1	19	16	41.83	-18	32.8	3.290	2.721	15.4	9.0	47.3W
2010	1	20	16	43.39	-18	36.9	3.281	2.721	15.6	9.0	47.9W
2010	1	21	16	44.95	-18	41.0	3.272	2.722	15.7	9.0	48.6W
2010	1	22	16	46.50	-18	45.0	3.262	2.723	15.9	9.0	49.2W
2010	1	23	16	48.05	-18	48.9	3.253	2.724	16.0	9.0	49.9W
2010	1	24	16	49.59	-18	52.8	3.243	2.725	16.2	9.0	50.5W
2010	1	25	16	51.12	-18	56.6	3.233	2.726	16.3	9.0	51.1W
2010	1	26	16	52.65	-19	0.3	3.223	2.726	16.5	9.0	51.8W
2010	1	27	16	54.17	-19	4.0	3.213	2.727	16.6	9.0	52.4W
2010	1	28	16	55.68	-19	7.6	3.203	2.728	16.8	9.0	53.1W
2010	1	29	16	57.19	-19	11.1	3.193	2.729	16.9	9.0	53.7W
2010	1	30	16	58.69	-19	14.6	3.183	2.730	17.1	9.0	54.4W
2010	1	31	17	0.18	-19	18.0	3.173	2.730	17.2	9.0	55.0W
2010	2	1	17	1.67	-19	21.3	3.162	2.731	17.3	9.0	55.7W
2010	2	2	17	3.15	-19	24.6	3.152	2.732	17.5	9.0	56.4W
2010	2	3	17	4.62	-19	27.9	3.141	2.733	17.6	9.0	57.0W
2010	2	4	17	6.08	-19	31.1	3.131	2.734	17.7	9.0	57.7W
2010	2	5	17	7.54	-19	34.2	3.120	2.735	17.9	9.0	58.4W
2010	2	6	17	8.98	-19	37.3	3.109	2.735	18.0	9.0	59.0W
2010	2	7	17	10.42	-19	40.3	3.098	2.736	18.1	9.0	59.7W
2010	2	8	17	11.85	-19	43.2	3.087	2.737	18.3	9.0	60.4W
2010	2	9	17	13.27	-19	46.1	3.076	2.738	18.4	9.0	61.0W
2010	2	10	17	14.69	-19	49.0	3.065	2.739	18.5	8.9	61.7W
2010	2	11	17	16.09	-19	51.8	3.054	2.739	18.6	8.9	62.4W
2010	2	12	17	17.49	-19	54.5	3.042	2.740	18.7	8.9	63.1W
2010	2	13	17	18.87	-19	57.2	3.031	2.741	18.8	8.9	63.7W
2010	2	14	17	20.25	-19	59.9	3.019	2.742	19.0	8.9	64.4W
2010	2	15	17	21.61	-20	2.5	3.008	2.743	19.1	8.9	65.1W
2010	2	16	17	22.97	-20	5.0	2.996	2.744	19.2	8.9	65.8W
2010	2	17	17	24.31	-20	7.5	2.985	2.744	19.3	8.9	66.5W
2010	2	18	17	25.65	-20	10.0	2.973	2.745	19.4	8.9	67.2W
2010	2	19	17	26.97	-20	12.4	2.961	2.746	19.5	8.9	67.9W
2010	2	20	17	28.29	-20	14.8	2.949	2.747	19.6	8.9	68.6W
2010	2	21	17	29.59	-20	17.1	2.937	2.748	19.7	8.9	69.3W
2010	2	22	17	30.88	-20	19.4	2.925	2.749	19.8	8.9	70.0W
2010	2	23	17	32.16	-20	21.7	2.913	2.749	19.9	8.9	70.7W
2010	2	24	17	33.43	-20	23.9	2.901	2.750	19.9	8.9	71.4W
2010	2	25	17	34.69	-20	26.1	2.889	2.751	20.0	8.9	72.1W
2010	2	26	17	35.93	-20	28.3	2.877	2.752	20.1	8.9	72.8W
2010	2	27	17	37.16	-20	30.4	2.865	2.753	20.2	8.9	73.5W
2010	2	28	17	38.38	-20	32.5	2.852	2.753	20.3	8.9	74.2W
2010	3	1	17	39.59	-20	34.5	2.840	2.754	20.3	8.9	75.0W
2010	3	2	17	40.78	-20	36.6	2.828	2.755	20.4	8.8	75.7W
2010	3	3	17	41.97	-20	38.6	2.815	2.756	20.5	8.8	76.4W
2010	3	4	17	43.13	-20	40.5	2.803	2.757	20.5	8.8	77.1W
2010	3	5	17	44.29	-20	42.5	2.790	2.758	20.6	8.8	77.9W
2010	3	6	17	45.43	-20	44.4	2.778	2.758	20.6	8.8	78.6W
2010	3	7	17	46.56	-20	46.3	2.765	2.759	20.7	8.8	79.3W
2010	3	8	17	47.67	-20	48.2	2.752	2.760	20.7	8.8	80.1W
2010	3	9	17	48.77	-20	50.0	2.740	2.761	20.8	8.8	80.8W
2010	3	10	17	49.85	-20	51.9	2.727	2.762	20.8	8.8	81.5W
2010	3	11	17	50.92	-20	53.7	2.714	2.763	20.9	8.8	82.3W
2010	3	12	17	51.97	-20	55.5	2.702	2.763	20.9	8.8	83.0W
2010	3	13	17	53.01	-20	57.3	2.689	2.764	20.9	8.8	83.8W
2010	3	14	17	54.03	-20	59.1	2.676	2.765	21.0	8.8	84.6W
2010	3	15	17	55.03	-21	0.8	2.663	2.766	21.0	8.7	85.3W
2010	3	16	17	56.02	-21	2.6	2.650	2.767	21.0	8.7	86.1W
2010	3	17	17	57.00	-21	4.4	2.638	2.767	21.0	8.7	86.9W
2010	3	18	17	57.95	-21	6.1	2.625	2.768	21.1	8.7	87.6W
2010	3	19	17	58.89	-21	7.9	2.612	2.769	21.1	8.7	88.4W
2010	3	20	17	59.81	-21	9.6	2.599	2.770	21.1	8.7	89.2W
2010	3	21	18	0.72	-21	11.3	2.586	2.771	21.1	8.7	90.0W
2010	3	22	18	1.60	-21	13.1	2.573	2.772	21.1	8.7	90.7W
2010	3	23	18	2.47	-21	14.8	2.561	2.772	21.1	8.7	91.5W
2010	3	24	18	3.32	-21	16.6	2.548	2.773	21.0	8.7	92.3W
2010	3	25	18	4.15	-21	18.3	2.535	2.774	21.0	8.6	93.1W
2010	3	26	18	4.97	-21	20.1	2.522	2.775	21.0	8.6	93.9W
2010	3	27	18	5.76	-21	21.8	2.509	2.776	21.0	8.6	94.7W

Date			R.A.2000		Decl.2000		Delta	r	Phase	Mag	Elong.
year	mo	day	hh	mm.mm	dd	pp.p	A.U.	A.U.	ø	V	ø
2010	3	28	18	6.54	-21	23.6	2.496	2.777	21.0	8.6	95.5W
2010	3	29	18	7.29	-21	25.4	2.484	2.777	20.9	8.6	96.4W
2010	3	30	18	8.02	-21	27.2	2.471	2.778	20.9	8.6	97.2W
2010	3	31	18	8.74	-21	29.0	2.458	2.779	20.9	8.6	98.0W
2010	4	1	18	9.43	-21	30.8	2.445	2.780	20.8	8.6	98.8W
2010	4	2	18	10.11	-21	32.7	2.433	2.781	20.8	8.6	99.7W
2010	4	3	18	10.76	-21	34.5	2.420	2.781	20.7	8.5	100.5W
2010	4	4	18	11.39	-21	36.4	2.407	2.782	20.6	8.5	101.3W
2010	4	5	18	12.00	-21	38.3	2.395	2.783	20.6	8.5	102.2W
2010	4	6	18	12.59	-21	40.2	2.382	2.784	20.5	8.5	103.0W
2010	4	7	18	13.15	-21	42.2	2.370	2.785	20.4	8.5	103.9W
2010	4	8	18	13.70	-21	44.1	2.357	2.785	20.3	8.5	104.7W
2010	4	9	18	14.22	-21	46.1	2.345	2.786	20.3	8.5	105.6W
2010	4	10	18	14.71	-21	48.2	2.332	2.787	20.2	8.4	106.5W
2010	4	11	18	15.19	-21	50.2	2.320	2.788	20.1	8.4	107.3W
2010	4	12	18	15.64	-21	52.3	2.308	2.789	20.0	8.4	108.2W
2010	4	13	18	16.07	-21	54.5	2.296	2.790	19.9	8.4	109.1W
2010	4	14	18	16.47	-21	56.6	2.284	2.790	19.7	8.4	110.0W
2010	4	15	18	16.85	-21	58.8	2.272	2.791	19.6	8.4	110.9W
2010	4	16	18	17.21	-22	1.0	2.260	2.792	19.5	8.4	111.8W
2010	4	17	18	17.54	-22	3.3	2.248	2.793	19.4	8.3	112.7W
2010	4	18	18	17.84	-22	5.6	2.236	2.794	19.2	8.3	113.6W
2010	4	19	18	18.12	-22	7.9	2.224	2.794	19.1	8.3	114.5W
2010	4	20	18	18.38	-22	10.3	2.213	2.795	18.9	8.3	115.4W
2010	4	21	18	18.61	-22	12.7	2.201	2.796	18.8	8.3	116.3W
2010	4	22	18	18.81	-22	15.2	2.190	2.797	18.6	8.3	117.3W
2010	4	23	18	18.99	-22	17.7	2.178	2.798	18.5	8.3	118.2W
2010	4	24	18	19.14	-22	20.2	2.167	2.798	18.3	8.2	119.1W
2010	4	25	18	19.26	-22	22.8	2.156	2.799	18.1	8.2	120.1W
2010	4	26	18	19.36	-22	25.4	2.145	2.800	17.9	8.2	121.0W
2010	4	27	18	19.43	-22	28.1	2.134	2.801	17.7	8.2	122.0W
2010	4	28	18	19.48	-22	30.8	2.123	2.802	17.5	8.2	123.0W
2010	4	29	18	19.50	-22	33.6	2.113	2.802	17.3	8.2	123.9W
2010	4	30	18	19.49	-22	36.4	2.102	2.803	17.1	8.1	124.9W
2010	5	1	18	19.45	-22	39.3	2.092	2.804	16.9	8.1	125.9W
2010	5	2	18	19.39	-22	42.1	2.082	2.805	16.7	8.1	126.9W
2010	5	3	18	19.30	-22	45.1	2.072	2.806	16.5	8.1	127.9W
2010	5	4	18	19.18	-22	48.1	2.062	2.806	16.2	8.1	128.9W
2010	5	5	18	19.04	-22	51.1	2.052	2.807	16.0	8.0	129.9W
2010	5	6	18	18.87	-22	54.2	2.042	2.808	15.8	8.0	130.9W
2010	5	7	18	18.67	-22	57.3	2.033	2.809	15.5	8.0	131.9W
2010	5	8	18	18.44	-23	0.4	2.023	2.810	15.2	8.0	132.9W
2010	5	9	18	18.18	-23	3.6	2.014	2.810	15.0	8.0	134.0W
2010	5	10	18	17.90	-23	6.8	2.005	2.811	14.7	8.0	135.0W
2010	5	11	18	17.59	-23	10.1	1.996	2.812	14.4	7.9	136.0W
2010	5	12	18	17.26	-23	13.4	1.988	2.813	14.2	7.9	137.1W
2010	5	13	18	16.89	-23	16.7	1.979	2.814	13.9	7.9	138.1W
2010	5	14	18	16.50	-23	20.1	1.971	2.814	13.6	7.9	139.2W
2010	5	15	18	16.09	-23	23.5	1.963	2.815	13.3	7.9	140.2W
2010	5	16	18	15.64	-23	27.0	1.955	2.816	13.0	7.8	141.3W
2010	5	17	18	15.18	-23	30.5	1.947	2.817	12.7	7.8	142.4W
2010	5	18	18	14.68	-23	34.0	1.940	2.818	12.3	7.8	143.5W
2010	5	19	18	14.16	-23	37.5	1.932	2.818	12.0	7.8	144.5W
2010	5	20	18	13.62	-23	41.0	1.925	2.819	11.7	7.8	145.6W
2010	5	21	18	13.04	-23	44.6	1.919	2.820	11.4	7.7	146.7W
2010	5	22	18	12.45	-23	48.2	1.912	2.821	11.0	7.7	147.8W
2010	5	23	18	11.83	-23	51.8	1.905	2.821	10.7	7.7	148.9W
2010	5	24	18	11.19	-23	55.5	1.899	2.822	10.3	7.7	150.0W
2010	5	25	18	10.53	-23	59.1	1.893	2.823	10	7.7	151.1W
2010	5	26	18	9.84	-24	2.8	1.888	2.824	9.6	7.6	152.3W
2010	5	27	18	9.13	-24	6.4	1.882	2.825	9.2	7.6	153.4W
2010	5	28	18	8.40	-24	10.1	1.877	2.825	8.9	7.6	154.5W
2010	5	29	18	7.65	-24	13.8	1.872	2.826	8.5	7.6	155.6W
2010	5	30	18	6.88	-24	17.5	1.867	2.827	8.1	7.5	156.8W
2010	5	31	18	6.09	-24	21.2	1.862	2.828	7.7	7.5	157.9W
2010	6	1	18	5.28	-24	24.8	1.858	2.828	7.4	7.5	159.1W
2010	6	2	18	4.45	-24	28.5	1.854	2.829	7.0	7.5	160.2W
2010	6	3	18	3.61	-24	32.2	1.850	2.830	6.6	7.5	161.3W
2010	6	4	18	2.75	-24	35.8	1.847	2.831	6.2	7.4	162.5W
2010	6	5	18	1.88	-24	39.4	1.844	2.831	5.8	7.4	163.6W
2010	6	6	18	0.99	-24	43.0	1.841	2.832	5.4	7.4	164.8W
2010	6	7	18	0.08	-24	46.6	1.838	2.833	5.0	7.4	165.9W
2010	6	8	17	59.17	-24	50.2	1.835	2.834	4.6	7.3	167.1W
2010	6	9	17	58.24	-24	53.8	1.833	2.835	4.2	7.3	168.2W
2010	6	10	17	57.31	-24	57.3	1.831	2.835	3.8	7.3	169.4W
2010	6	11	17	56.36	-25	0.8	1.830	2.836	3.4	7.3	170.5W
2010	6	12	17	55.40	-25	4.2	1.828	2.837	3.0	7.2	171.7W
2010	6	13	17	54.44	-25	7.7	1.827	2.838	2.6	7.2	172.8W
2010	6	14	17	53.47	-25	11.1	1.826	2.838	2.2	7.2	173.9W
2010	6	15	17	52.50	-25	14.4	1.826	2.839	1.8	7.1	175.0W
2010	6	16	17	51.52	-25	17.7	1.826	2.840	1.4	7.1	176.1W
2010	6	17	17	50.53	-25	21.0	1.826	2.841	1.1	7.1	177.0W
2010	6	18	17	49.55	-25	24.2	1.826	2.841	0.8	7.1	177.7W
2010	6	19	17	48.56	-25	27.4	1.826	2.842	0.7	7.0	178.0E
2010	6	20	17	47.58	-25	30.6	1.827	2.843	0.9	7.1	177.6E
2010	6	21	17	46.59	-25	33.7	1.828	2.844	1.2	7.1	176.8E
2010	6	22	17	45.61	-25	36.7	1.830	2.844	1.5	7.1	175.8E
2010	6	23	17	44.63	-25	39.7	1.832	2.845	1.9	7.2	174.7E
2010	6	24	17	43.66	-25	42.7	1.834	2.846	2.3	7.2	173.6E
2010	6	25	17	42.69	-25	45.6	1.836	2.847	2.7	7.2	172.5E
2010	6	26	17	41.72	-25	48.4	1.838	2.847	3.1	7.3	171.4E

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2010 6 27	17 40.77	-25 51.2	1.841	2.848	3.5	7.3	170.2E
2010 6 28	17 39.82	-25 54.0	1.844	2.849	3.9	7.3	169.1E
2010 6 29	17 38.88	-25 56.7	1.847	2.850	4.3	7.3	167.9E
2010 6 30	17 37.96	-25 59.3	1.851	2.850	4.7	7.4	166.8E
2010 7 1	17 37.04	-26 1.9	1.855	2.851	5.1	7.4	165.7E
2010 7 2	17 36.14	-26 4.4	1.859	2.852	5.5	7.4	164.5E
2010 7 3	17 35.25	-26 6.9	1.863	2.853	5.9	7.4	163.4E
2010 7 4	17 34.37	-26 9.4	1.868	2.853	6.2	7.5	162.2E
2010 7 5	17 33.51	-26 11.8	1.873	2.854	6.6	7.5	161.1E
2010 7 6	17 32.67	-26 14.1	1.878	2.855	7.0	7.5	160.0E
2010 7 7	17 31.84	-26 16.4	1.884	2.855	7.4	7.6	158.8E
2010 7 8	17 31.03	-26 18.7	1.889	2.856	7.8	7.6	157.7E
2010 7 9	17 30.24	-26 20.9	1.895	2.857	8.1	7.6	156.6E
2010 7 10	17 29.47	-26 23.0	1.901	2.858	8.5	7.6	155.5E
2010 7 11	17 28.72	-26 25.2	1.908	2.858	8.9	7.6	154.3E
2010 7 12	17 27.99	-26 27.2	1.915	2.859	9.2	7.7	153.2E
2010 7 13	17 27.27	-26 29.3	1.921	2.860	9.6	7.7	152.1E
2010 7 14	17 26.59	-26 31.3	1.929	2.861	9.9	7.7	151.0E
2010 7 15	17 25.92	-26 33.2	1.936	2.861	10.3	7.7	149.9E
2010 7 16	17 25.28	-26 35.1	1.944	2.862	10.6	7.8	148.8E
2010 7 17	17 24.65	-26 37.0	1.951	2.863	10.9	7.8	147.7E
2010 7 18	17 24.06	-26 38.9	1.959	2.863	11.2	7.8	146.7E
2010 7 19	17 23.49	-26 40.7	1.968	2.864	11.6	7.8	145.6E
2010 7 20	17 22.94	-26 42.5	1.976	2.865	11.9	7.9	144.5E
2010 7 21	17 22.41	-26 44.3	1.985	2.866	12.2	7.9	143.4E
2010 7 22	17 21.92	-26 46.0	1.994	2.866	12.5	7.9	142.4E
2010 7 23	17 21.45	-26 47.7	2.003	2.867	12.8	7.9	141.3E
2010 7 24	17 21.00	-26 49.4	2.012	2.868	13.1	7.9	140.3E
2010 7 25	17 20.58	-26 51.1	2.021	2.868	13.4	8.0	139.2E
2010 7 26	17 20.19	-26 52.7	2.031	2.869	13.7	8.0	138.2E
2010 7 27	17 19.82	-26 54.3	2.041	2.870	13.9	8.0	137.2E
2010 7 28	17 19.48	-26 55.9	2.051	2.870	14.2	8.0	136.1E
2010 7 29	17 19.17	-26 57.5	2.061	2.871	14.5	8.0	135.1E
2010 7 30	17 18.88	-26 59.1	2.071	2.872	14.7	8.1	134.1E
2010 7 31	17 18.62	-27 0.6	2.082	2.873	15.0	8.1	133.1E
2010 8 1	17 18.39	-27 2.1	2.092	2.873	15.2	8.1	132.1E
2010 8 2	17 18.18	-27 3.7	2.103	2.874	15.4	8.1	131.1E
2010 8 3	17 18.01	-27 5.2	2.114	2.875	15.7	8.1	130.1E
2010 8 4	17 17.86	-27 6.7	2.125	2.875	15.9	8.2	129.1E
2010 8 5	17 17.73	-27 8.1	2.137	2.876	16.1	8.2	128.1E
2010 8 6	17 17.64	-27 9.6	2.148	2.877	16.3	8.2	127.2E
2010 8 7	17 17.57	-27 11.1	2.160	2.877	16.5	8.2	126.2E
2010 8 8	17 17.53	-27 12.5	2.171	2.878	16.7	8.2	125.2E
2010 8 9	17 17.51	-27 14.0	2.183	2.879	16.9	8.3	124.3E
2010 8 10	17 17.52	-27 15.4	2.195	2.879	17.1	8.3	123.3E
2010 8 11	17 17.56	-27 16.9	2.207	2.880	17.3	8.3	122.4E
2010 8 12	17 17.63	-27 18.3	2.220	2.881	17.5	8.3	121.4E
2010 8 13	17 17.72	-27 19.7	2.232	2.881	17.6	8.3	120.5E
2010 8 14	17 17.84	-27 21.1	2.244	2.882	17.8	8.4	119.6E
2010 8 15	17 17.98	-27 22.6	2.257	2.883	18.0	8.4	118.6E
2010 8 16	17 18.15	-27 24.0	2.270	2.883	18.1	8.4	117.7E
2010 8 17	17 18.35	-27 25.4	2.282	2.884	18.3	8.4	116.8E
2010 8 18	17 18.57	-27 26.8	2.295	2.885	18.4	8.4	115.9E
2010 8 19	17 18.82	-27 28.2	2.308	2.885	18.5	8.4	115.0E
2010 8 20	17 19.09	-27 29.6	2.321	2.886	18.7	8.5	114.1E
2010 8 21	17 19.39	-27 30.9	2.334	2.887	18.8	8.5	113.2E
2010 8 22	17 19.71	-27 32.3	2.348	2.887	18.9	8.5	112.3E
2010 8 23	17 20.06	-27 33.7	2.361	2.888	19.0	8.5	111.4E
2010 8 24	17 20.43	-27 35.1	2.374	2.889	19.1	8.5	110.6E
2010 8 25	17 20.82	-27 36.5	2.388	2.889	19.2	8.5	109.7E
2010 8 26	17 21.24	-27 37.8	2.401	2.890	19.3	8.6	108.8E
2010 8 27	17 21.68	-27 39.2	2.415	2.891	19.4	8.6	108.0E
2010 8 28	17 22.15	-27 40.5	2.428	2.891	19.5	8.6	107.1E
2010 8 29	17 22.64	-27 41.9	2.442	2.892	19.6	8.6	106.2E
2010 8 30	17 23.15	-27 43.2	2.456	2.893	19.7	8.6	105.4E
2010 8 31	17 23.68	-27 44.6	2.470	2.893	19.7	8.6	104.5E
2010 9 1	17 24.24	-27 45.9	2.484	2.894	19.8	8.7	103.7E
2010 9 2	17 24.82	-27 47.2	2.498	2.895	19.9	8.7	102.9E
2010 9 3	17 25.42	-27 48.5	2.511	2.895	19.9	8.7	102.0E
2010 9 4	17 26.04	-27 49.8	2.525	2.896	20.0	8.7	101.2E
2010 9 5	17 26.68	-27 51.1	2.540	2.896	20.0	8.7	100.4E
2010 9 6	17 27.35	-27 52.4	2.554	2.897	20.1	8.7	99.6E
2010 9 7	17 28.03	-27 53.7	2.568	2.898	20.1	8.7	98.8E
2010 9 8	17 28.74	-27 54.9	2.582	2.898	20.1	8.8	97.9E
2010 9 9	17 29.46	-27 56.2	2.596	2.899	20.2	8.8	97.1E
2010 9 10	17 30.21	-27 57.4	2.610	2.900	20.2	8.8	96.3E
2010 9 11	17 30.97	-27 58.7	2.624	2.900	20.2	8.8	95.5E
2010 9 12	17 31.76	-27 59.9	2.639	2.901	20.2	8.8	94.7E
2010 9 13	17 32.56	-28 1.1	2.653	2.901	20.2	8.8	94.0E
2010 9 14	17 33.38	-28 2.3	2.667	2.902	20.3	8.8	93.2E
2010 9 15	17 34.22	-28 3.4	2.681	2.903	20.3	8.8	92.4E
2010 9 16	17 35.08	-28 4.6	2.696	2.903	20.3	8.9	91.6E
2010 9 17	17 35.96	-28 5.7	2.710	2.904	20.3	8.9	90.8E
2010 9 18	17 36.86	-28 6.8	2.724	2.905	20.2	8.9	90.0E
2010 9 19	17 37.77	-28 7.9	2.739	2.905	20.2	8.9	89.3E
2010 9 20	17 38.70	-28 9.0	2.753	2.906	20.2	8.9	88.5E
2010 9 21	17 39.65	-28 10.0	2.767	2.906	20.2	8.9	87.7E
2010 9 22	17 40.61	-28 11.1	2.782	2.907	20.2	8.9	87.0E
2010 9 23	17 41.59	-28 12.1	2.796	2.908	20.1	8.9	86.2E
2010 9 24	17 42.59	-28 13.0	2.810	2.908	20.1	8.9	85.5E
2010 9 25	17 43.60	-28 14.0	2.824	2.909	20.1	9.0	84.7E



## 1 Ceres

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2010 9 26	17 44.63	-28 14.9	2.839	2.909	20.0	9.0	84.0E
2010 9 27	17 45.68	-28 15.8	2.853	2.910	20.0	9.0	83.2E
2010 9 28	17 46.74	-28 16.7	2.867	2.911	20.0	9.0	82.5E
2010 9 29	17 47.81	-28 17.6	2.881	2.911	19.9	9.0	81.7E

## 2 Pallas

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2010 3 5	15 48.92	+ 9 12.2	2.160	2.652	20.7	9.0	108.9W
2010 3 6	15 49.43	+ 9 27.6	2.152	2.655	20.6	9.0	109.6W
2010 3 7	15 49.92	+ 9 43.2	2.144	2.657	20.5	9.0	110.4W
2010 3 8	15 50.38	+ 9 59.0	2.136	2.660	20.4	9.0	111.1W
2010 3 9	15 50.82	+10 14.9	2.128	2.662	20.2	9.0	111.9W
2010 3 10	15 51.24	+10 30.8	2.120	2.665	20.1	8.9	112.6W
2010 3 11	15 51.63	+10 46.9	2.112	2.667	20.0	8.9	113.4W
2010 3 12	15 51.99	+11 3.2	2.105	2.669	19.9	8.9	114.1W
2010 3 13	15 52.33	+11 19.5	2.098	2.672	19.7	8.9	114.8W
2010 3 14	15 52.64	+11 35.9	2.090	2.674	19.6	8.9	115.6W
2010 3 15	15 52.92	+11 52.4	2.083	2.677	19.5	8.9	116.3W
2010 3 16	15 53.18	+12 9.0	2.076	2.679	19.3	8.9	117.0W
2010 3 17	15 53.42	+12 25.7	2.070	2.682	19.2	8.9	117.8W
2010 3 18	15 53.62	+12 42.4	2.063	2.684	19.0	8.9	118.5W
2010 3 19	15 53.80	+12 59.2	2.057	2.687	18.9	8.9	119.2W
2010 3 20	15 53.96	+13 16.1	2.050	2.689	18.7	8.8	119.9W
2010 3 21	15 54.08	+13 33.0	2.044	2.691	18.6	8.8	120.6W
2010 3 22	15 54.18	+13 50.0	2.038	2.694	18.4	8.8	121.3W
2010 3 23	15 54.25	+14 7.0	2.032	2.696	18.3	8.8	122.0W
2010 3 24	15 54.30	+14 24.0	2.027	2.699	18.1	8.8	122.7W
2010 3 25	15 54.32	+14 41.0	2.021	2.701	18.0	8.8	123.4W
2010 3 26	15 54.31	+14 58.1	2.016	2.704	17.8	8.8	124.0W
2010 3 27	15 54.28	+15 15.1	2.011	2.706	17.6	8.8	124.7W
2010 3 28	15 54.21	+15 32.1	2.006	2.708	17.5	8.8	125.3W
2010 3 29	15 54.12	+15 49.2	2.001	2.711	17.3	8.8	126.0W
2010 3 30	15 54.01	+16 6.1	1.997	2.713	17.2	8.8	126.6W
2010 3 31	15 53.87	+16 23.1	1.992	2.716	17.0	8.7	127.2W
2010 4 1	15 53.70	+16 40.0	1.988	2.718	16.9	8.7	127.9W
2010 4 2	15 53.50	+16 56.8	1.984	2.721	16.7	8.7	128.5W
2010 4 3	15 53.28	+17 13.6	1.980	2.723	16.6	8.7	129.0W
2010 4 4	15 53.03	+17 30.2	1.977	2.725	16.4	8.7	129.6W
2010 4 5	15 52.75	+17 46.8	1.973	2.728	16.3	8.7	130.2W
2010 4 6	15 52.45	+18 3.3	1.970	2.730	16.1	8.7	130.7W
2010 4 7	15 52.13	+18 19.7	1.967	2.733	16.0	8.7	131.3W
2010 4 8	15 51.78	+18 36.0	1.964	2.735	15.8	8.7	131.8W
2010 4 9	15 51.40	+18 52.1	1.962	2.738	15.7	8.7	132.3W
2010 4 10	15 51.00	+19 8.1	1.959	2.740	15.6	8.7	132.8W
2010 4 11	15 50.58	+19 23.9	1.957	2.742	15.4	8.7	133.2W
2010 4 12	15 50.13	+19 39.6	1.955	2.745	15.3	8.7	133.7W
2010 4 13	15 49.66	+19 55.1	1.953	2.747	15.2	8.7	134.1W
2010 4 14	15 49.16	+20 10.4	1.952	2.750	15.1	8.7	134.5W
2010 4 15	15 48.65	+20 25.5	1.950	2.752	15.0	8.7	134.9W
2010 4 16	15 48.11	+20 40.4	1.949	2.754	14.9	8.7	135.3W
2010 4 17	15 47.55	+20 55.1	1.948	2.757	14.8	8.6	135.6W
2010 4 18	15 46.97	+21 9.6	1.948	2.759	14.7	8.6	136.0W
2010 4 19	15 46.37	+21 23.8	1.947	2.762	14.6	8.6	136.3W
2010 4 20	15 45.75	+21 37.8	1.947	2.764	14.5	8.6	136.5W
2010 4 21	15 45.11	+21 51.6	1.947	2.766	14.4	8.6	136.8W
2010 4 22	15 44.45	+22 5.0	1.947	2.769	14.3	8.6	137.0W
2010 4 23	15 43.78	+22 18.2	1.948	2.771	14.3	8.6	137.2W
2010 4 24	15 43.09	+22 31.2	1.948	2.774	14.2	8.6	137.4W
2010 4 25	15 42.38	+22 43.8	1.949	2.776	14.2	8.6	137.6W
2010 4 26	15 41.66	+22 56.1	1.950	2.778	14.1	8.6	137.7W
2010 4 27	15 40.92	+23 8.2	1.952	2.781	14.1	8.6	137.8W
2010 4 28	15 40.17	+23 19.9	1.953	2.783	14.0	8.6	137.9W
2010 4 29	15 39.41	+23 31.3	1.955	2.785	14.0	8.7	137.9W
2010 4 30	15 38.64	+23 42.4	1.957	2.788	14.0	8.7	138.0W
2010 5 1	15 37.85	+23 53.2	1.959	2.790	14.0	8.7	138.0W
2010 5 2	15 37.05	+24 3.6	1.961	2.793	14.0	8.7	137.9W
2010 5 3	15 36.25	+24 13.6	1.964	2.795	14.0	8.7	137.9W
2010 5 4	15 35.44	+24 23.4	1.967	2.797	14.0	8.7	137.8W
2010 5 5	15 34.62	+24 32.7	1.970	2.800	14.0	8.7	137.7W
2010 5 6	15 33.79	+24 41.7	1.973	2.802	14.0	8.7	137.6W
2010 5 7	15 32.96	+24 50.4	1.977	2.804	14.1	8.7	137.5W
2010 5 8	15 32.12	+24 58.7	1.980	2.807	14.1	8.7	137.3W
2010 5 9	15 31.28	+25 6.6	1.984	2.809	14.2	8.7	137.1W
2010 5 10	15 30.44	+25 14.1	1.988	2.811	14.2	8.7	136.9W
2010 5 11	15 29.60	+25 21.3	1.993	2.814	14.3	8.7	136.6W
2010 5 12	15 28.75	+25 28.1	1.997	2.816	14.3	8.7	136.4W
2010 5 13	15 27.91	+25 34.5	2.002	2.818	14.4	8.7	136.1W
2010 5 14	15 27.06	+25 40.6	2.007	2.821	14.5	8.8	135.8W
2010 5 15	15 26.22	+25 46.2	2.012	2.823	14.5	8.8	135.5W
2010 5 16	15 25.39	+25 51.5	2.017	2.825	14.6	8.8	135.1E
2010 5 17	15 24.55	+25 56.4	2.023	2.828	14.7	8.8	134.8E
2010 5 18	15 23.72	+26 1	2.029	2.830	14.8	8.8	134.4E
2010 5 19	15 22.90	+26 5.1	2.034	2.832	14.9	8.8	134.0E
2010 5 20	15 22.08	+26 8.9	2.041	2.835	15.0	8.8	133.6E
2010 5 21	15 21.27	+26 12.3	2.047	2.837	15.1	8.8	133.2E
2010 5 22	15 20.47	+26 15.4	2.053	2.839	15.2	8.8	132.7E

## 2 Pallas

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2010 5 23	15 19.68	+26 18.1	2.060	2.842	15.3	8.9	132.3E
2010 5 24	15 18.90	+26 20.4	2.067	2.844	15.4	8.9	131.8E
2010 5 25	15 18.13	+26 22.3	2.074	2.846	15.5	8.9	131.4E
2010 5 26	15 17.37	+26 23.9	2.081	2.849	15.6	8.9	130.9E
2010 5 27	15 16.62	+26 25.1	2.088	2.851	15.7	8.9	130.4E
2010 5 28	15 15.89	+26 26.0	2.096	2.853	15.8	8.9	129.8E
2010 5 29	15 15.16	+26 26.6	2.104	2.856	15.9	8.9	129.3E
2010 5 30	15 14.46	+26 26.8	2.111	2.858	16.0	8.9	128.8E
2010 5 31	15 13.77	+26 26.6	2.119	2.860	16.2	9.0	128.3E
2010 6 1	15 13.09	+26 26.1	2.128	2.862	16.3	9.0	127.7E
2010 6 2	15 12.43	+26 25.3	2.136	2.865	16.4	9.0	127.2E

## 4 Vesta

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2010 1 1	10 41.21	+14 10.0	1.754	2.440	19.6	7.1	123.7W
2010 1 2	10 41.39	+14 13.6	1.742	2.439	19.4	7.1	124.6W
2010 1 3	10 41.55	+14 17.3	1.731	2.438	19.1	7.1	125.6W
2010 1 4	10 41.67	+14 21.2	1.719	2.437	18.9	7.1	126.6W
2010 1 5	10 41.77	+14 25.3	1.708	2.437	18.6	7.1	127.7W
2010 1 6	10 41.84	+14 29.7	1.697	2.436	18.4	7.0	128.7W
2010 1 7	10 41.88	+14 34.2	1.686	2.435	18.1	7.0	129.7W
2010 1 8	10 41.89	+14 38.9	1.675	2.434	17.8	7.0	130.7W
2010 1 9	10 41.87	+14 43.8	1.665	2.433	17.5	7.0	131.8W
2010 1 10	10 41.82	+14 48.9	1.654	2.432	17.3	7.0	132.8W
2010 1 11	10 41.74	+14 54.1	1.644	2.431	17.0	6.9	133.9W
2010 1 12	10 41.63	+14 59.6	1.634	2.430	16.7	6.9	134.9W
2010 1 13	10 41.50	+15 5.2	1.624	2.429	16.3	6.9	136.0W
2010 1 14	10 41.33	+15 11.1	1.614	2.428	16.0	6.9	137.1W
2010 1 15	10 41.13	+15 17.1	1.605	2.427	15.7	6.8	138.1W
2010 1 16	10 40.90	+15 23.2	1.595	2.427	15.4	6.8	139.2W
2010 1 17	10 40.64	+15 29.6	1.586	2.426	15.0	6.8	140.3W
2010 1 18	10 40.36	+15 36.1	1.577	2.425	14.7	6.8	141.4W
2010 1 19	10 40.04	+15 42.8	1.568	2.424	14.3	6.7	142.5W
2010 1 20	10 39.69	+15 49.7	1.559	2.423	13.9	6.7	143.6W
2010 1 21	10 39.31	+15 56.7	1.551	2.422	13.6	6.7	144.7W
2010 1 22	10 38.91	+16 3.8	1.543	2.421	13.2	6.7	145.8W
2010 1 23	10 38.47	+16 11.1	1.535	2.420	12.8	6.7	146.9W
2010 1 24	10 38.01	+16 18.6	1.527	2.419	12.4	6.6	148.1W
2010 1 25	10 37.52	+16 26.1	1.519	2.418	12.0	6.6	149.2W
2010 1 26	10 36.99	+16 33.8	1.512	2.417	11.6	6.6	150.3W
2010 1 27	10 36.45	+16 41.6	1.505	2.416	11.2	6.6	151.5W
2010 1 28	10 35.87	+16 49.6	1.498	2.415	10.8	6.5	152.6W
2010 1 29	10 35.27	+16 57.6	1.492	2.414	10.4	6.5	153.7W
2010 1 30	10 34.64	+17 5.7	1.485	2.413	10	6.5	154.8W
2010 1 31	10 33.98	+17 14.0	1.479	2.412	9.6	6.5	156.0W
2010 2 1	10 33.30	+17 22.3	1.473	2.412	9.1	6.4	157.1W
2010 2 2	10 32.60	+17 30.6	1.468	2.411	8.7	6.4	158.2W
2010 2 3	10 31.87	+17 39.1	1.462	2.410	8.3	6.4	159.3W
2010 2 4	10 31.11	+17 47.5	1.457	2.409	7.9	6.4	160.5W
2010 2 5	10 30.34	+17 56.1	1.452	2.408	7.4	6.3	161.6W
2010 2 6	10 29.55	+18 4.6	1.448	2.407	7.0	6.3	162.6W
2010 2 7	10 28.73	+18 13.2	1.443	2.406	6.6	6.3	163.7W
2010 2 8	10 27.90	+18 21.8	1.439	2.405	6.2	6.3	164.7W
2010 2 9	10 27.04	+18 30.4	1.435	2.404	5.8	6.3	165.8W
2010 2 10	10 26.17	+18 39.0	1.432	2.403	5.4	6.2	166.7W
2010 2 11	10 25.29	+18 47.6	1.429	2.402	5.0	6.2	167.7W
2010 2 12	10 24.39	+18 56.1	1.426	2.401	4.7	6.2	168.5W
2010 2 13	10 23.47	+19 4.6	1.423	2.400	4.4	6.2	169.3W
2010 2 14	10 22.54	+19 13.1	1.421	2.399	4.1	6.2	170.0W
2010 2 15	10 21.60	+19 21.5	1.418	2.398	3.9	6.1	170.6W
2010 2 16	10 20.65	+19 29.8	1.416	2.397	3.7	6.1	171.0W
2010 2 17	10 19.70	+19 38.0	1.415	2.396	3.6	6.1	171.3W
2010 2 18	10 18.73	+19 46.2	1.414	2.395	3.6	6.1	171.4W
2010 2 19	10 17.76	+19 54.2	1.413	2.394	3.6	6.1	171.3W
2010 2 20	10 16.78	+20 2.2	1.412	2.393	3.7	6.1	171.0W
2010 2 21	10 15.80	+20 10.0	1.411	2.392	3.9	6.1	170.6E
2010 2 22	10 14.82	+20 17.7	1.411	2.391	4.1	6.1	170.0E
2010 2 23	10 13.84	+20 25.3	1.411	2.390	4.4	6.1	169.3E
2010 2 24	10 12.86	+20 32.7	1.412	2.389	4.7	6.2	168.5E
2010 2 25	10 11.88	+20 39.9	1.412	2.388	5.1	6.2	167.6E
2010 2 26	10 10.90	+20 47.0	1.413	2.387	5.5	6.2	166.7E
2010 2 27	10 9.93	+20 53.9	1.414	2.386	5.9	6.2	165.7E
2010 2 28	10 8.96	+21 0.7	1.416	2.385	6.3	6.2	164.7E
2010 3 1	10 8.01	+21 7.2	1.417	2.384	6.7	6.2	163.7E
2010 3 2	10 7.06	+21 13.6	1.419	2.384	7.1	6.3	162.6E
2010 3 3	10 6.12	+21 19.8	1.421	2.383	7.6	6.3	161.6E
2010 3 4	10 5.20	+21 25.8	1.424	2.382	8.0	6.3	160.5E
2010 3 5	10 4.29	+21 31.5	1.427	2.381	8.4	6.3	159.4E
2010 3 6	10 3.39	+21 37.1	1.430	2.380	8.9	6.3	158.2E
2010 3 7	10 2.51	+21 42.4	1.433	2.379	9.3	6.4	157.1E
2010 3 8	10 1.64	+21 47.5	1.436	2.378	9.8	6.4	156.0E
2010 3 9	10 0.79	+21 52.4	1.440	2.377	10.2	6.4	154.9E
2010 3 10	9 59.96	+21 57.1	1.444	2.376	10.7	6.4	153.7E
2010 3 11	9 59.16	+22 1.6	1.448	2.375	11.1	6.4	152.6E
2010 3 12	9 58.37	+22 5.8	1.453	2.374	11.5	6.5	151.5E
2010 3 13	9 57.60	+22 9.8	1.457	2.373	12.0	6.5	150.4E

Date	R.A.2000	Decl.2000	Delta	r	Phase	Mag	Elong.
year mo day	hh mm.mm	dd pp.p	A.U.	A.U.	ø	V	ø
2010	3 14	9 56.86	+22 13.5	1.462	2.372	12.4	6.5 149.2E
2010	3 15	9 56.14	+22 17.1	1.467	2.371	12.8	6.5 148.1E
2010	3 16	9 55.45	+22 20.3	1.473	2.370	13.2	6.5 147.0E
2010	3 17	9 54.78	+22 23.4	1.478	2.369	13.6	6.5 145.9E
2010	3 18	9 54.14	+22 26.2	1.484	2.368	14.0	6.6 144.8E
2010	3 19	9 53.52	+22 28.8	1.490	2.367	14.4	6.6 143.7E
2010	3 20	9 52.93	+22 31.2	1.496	2.366	14.8	6.6 142.6E
2010	3 21	9 52.37	+22 33.3	1.502	2.365	15.2	6.6 141.5E
2010	3 22	9 51.84	+22 35.2	1.509	2.364	15.6	6.6 140.4E
2010	3 23	9 51.34	+22 36.9	1.516	2.363	16.0	6.7 139.3E
2010	3 24	9 50.87	+22 38.3	1.523	2.362	16.3	6.7 138.3E
2010	3 25	9 50.42	+22 39.5	1.530	2.361	16.7	6.7 137.2E
2010	3 26	9 50.01	+22 40.5	1.537	2.360	17.0	6.7 136.2E
2010	3 27	9 49.63	+22 41.3	1.544	2.359	17.4	6.7 135.1E
2010	3 28	9 49.28	+22 41.9	1.552	2.358	17.7	6.8 134.1E
2010	3 29	9 48.95	+22 42.2	1.560	2.357	18.0	6.8 133.0E
2010	3 30	9 48.67	+22 42.3	1.568	2.356	18.4	6.8 132.0E
2010	3 31	9 48.41	+22 42.2	1.576	2.355	18.7	6.8 131.0E
2010	4 1	9 48.18	+22 42.0	1.584	2.354	19.0	6.8 130.0E
2010	4 2	9 47.99	+22 41.5	1.592	2.353	19.3	6.8 129.0E
2010	4 3	9 47.82	+22 40.8	1.601	2.352	19.6	6.9 128.0E
2010	4 4	9 47.69	+22 39.8	1.609	2.351	19.9	6.9 127.0E
2010	4 5	9 47.59	+22 38.8	1.618	2.350	20.1	6.9 126.0E
2010	4 6	9 47.52	+22 37.5	1.627	2.349	20.4	6.9 125.0E
2010	4 7	9 47.48	+22 36.0	1.636	2.348	20.7	6.9 124.1E
2010	4 8	9 47.47	+22 34.3	1.645	2.347	20.9	7.0 123.1E
2010	4 9	9 47.50	+22 32.4	1.654	2.346	21.2	7.0 122.2E
2010	4 10	9 47.55	+22 30.4	1.663	2.345	21.4	7.0 121.2E
2010	4 11	9 47.64	+22 28.2	1.673	2.344	21.7	7.0 120.3E
2010	4 12	9 47.75	+22 25.8	1.682	2.343	21.9	7.0 119.4E
2010	4 13	9 47.90	+22 23.2	1.692	2.342	22.1	7.0 118.5E
2010	4 14	9 48.08	+22 20.5	1.702	2.341	22.3	7.1 117.5E
2010	4 15	9 48.28	+22 17.6	1.711	2.340	22.5	7.1 116.6E
2010	4 16	9 48.52	+22 14.5	1.721	2.339	22.7	7.1 115.7E
2010	4 17	9 48.78	+22 11.3	1.731	2.338	22.9	7.1 114.9E
2010	4 18	9 49.07	+22 7.9	1.741	2.337	23.1	7.1 114.0E
2010	4 19	9 49.39	+22 4.3	1.751	2.336	23.3	7.1 113.1E
2010	4 20	9 49.74	+22 0.6	1.761	2.335	23.5	7.2 112.2E
2010	4 21	9 50.12	+21 56.8	1.772	2.334	23.6	7.2 111.4E
2010	4 22	9 50.52	+21 52.8	1.782	2.333	23.8	7.2 110.5E
2010	4 23	9 50.95	+21 48.6	1.792	2.332	24.0	7.2 109.7E
2010	4 24	9 51.41	+21 44.3	1.803	2.331	24.1	7.2 108.8E
2010	4 25	9 51.89	+21 39.9	1.813	2.330	24.2	7.2 108.0E
2010	4 26	9 52.40	+21 35.3	1.824	2.329	24.4	7.3 107.2E
2010	4 27	9 52.94	+21 30.6	1.834	2.328	24.5	7.3 106.4E
2010	4 28	9 53.50	+21 25.7	1.845	2.327	24.6	7.3 105.6E
2010	4 29	9 54.08	+21 20.8	1.856	2.326	24.8	7.3 104.8E
2010	4 30	9 54.69	+21 15.7	1.866	2.325	24.9	7.3 104.0E
2010	5 1	9 55.32	+21 10.4	1.877	2.324	25.0	7.3 103.2E
2010	5 2	9 55.98	+21 5.0	1.888	2.323	25.1	7.3 102.4E
2010	5 3	9 56.66	+20 59.5	1.899	2.322	25.2	7.4 101.6E
2010	5 4	9 57.36	+20 53.9	1.909	2.321	25.3	7.4 100.8E
2010	5 5	9 58.09	+20 48.2	1.920	2.320	25.3	7.4 100.1E
2010	5 6	9 58.83	+20 42.3	1.931	2.319	25.4	7.4 99.3E
2010	5 7	9 59.60	+20 36.3	1.942	2.318	25.5	7.4 98.5E
2010	5 8	10 0.39	+20 30.2	1.953	2.317	25.6	7.4 97.8E
2010	5 9	10 1.20	+20 24.0	1.964	2.316	25.6	7.4 97.1E
2010	5 10	10 2.03	+20 17.7	1.975	2.315	25.7	7.4 96.3E
2010	5 11	10 2.88	+20 11.3	1.986	2.314	25.7	7.5 95.6E
2010	5 12	10 3.75	+20 4.7	1.997	2.313	25.8	7.5 94.9E
2010	5 13	10 4.64	+19 58.1	2.008	2.312	25.8	7.5 94.1E
2010	5 14	10 5.55	+19 51.3	2.019	2.311	25.9	7.5 93.4E
2010	5 15	10 6.47	+19 44.5	2.030	2.310	25.9	7.5 92.7E
2010	5 16	10 7.42	+19 37.5	2.041	2.309	26.0	7.5 92.0E
2010	5 17	10 8.38	+19 30.4	2.052	2.308	26.0	7.5 91.3E
2010	5 18	10 9.36	+19 23.2	2.063	2.307	26.0	7.5 90.6E
2010	5 19	10 10.36	+19 16.0	2.074	2.306	26.0	7.6 89.9E
2010	5 20	10 11.37	+19 8.6	2.085	2.305	26.0	7.6 89.2E
2010	5 21	10 12.40	+19 1.1	2.096	2.304	26.0	7.6 88.5E
2010	5 22	10 13.45	+18 53.5	2.107	2.303	26.1	7.6 87.9E
2010	5 23	10 14.51	+18 45.9	2.118	2.302	26.1	7.6 87.2E
2010	5 24	10 15.59	+18 38.1	2.129	2.301	26.1	7.6 86.5E
2010	5 25	10 16.69	+18 30.3	2.140	2.300	26.1	7.6 85.9E
2010	5 26	10 17.79	+18 22.3	2.151	2.299	26.0	7.6 85.2E
2010	5 27	10 18.92	+18 14.3	2.161	2.298	26.0	7.6 84.5E
2010	5 28	10 20.05	+18 6.2	2.172	2.297	26.0	7.6 83.9E
2010	5 29	10 21.20	+17 57.9	2.183	2.296	26.0	7.7 83.2E
2010	5 30	10 22.37	+17 49.6	2.194	2.295	26.0	7.7 82.6E
2010	5 31	10 23.55	+17 41.3	2.205	2.294	25.9	7.7 82.0E
2010	6 1	10 24.74	+17 32.8	2.216	2.293	25.9	7.7 81.3E
2010	6 2	10 25.94	+17 24.2	2.226	2.292	25.9	7.7 80.7E
2010	6 3	10 27.16	+17 15.6	2.237	2.291	25.9	7.7 80.1E
2010	6 4	10 28.39	+17 6.8	2.248	2.290	25.8	7.7 79.4E
2010	6 5	10 29.63	+16 58.0	2.259	2.289	25.8	7.7 78.8E
2010	6 6	10 30.88	+16 49.2	2.269	2.288	25.7	7.7 78.2E
2010	6 7	10 32.15	+16 40.2	2.280	2.287	25.7	7.7 77.6E
2010	6 8	10 33.42	+16 31.1	2.290	2.286	25.6	7.7 77.0E
2010	6 9	10 34.71	+16 22.0	2.301	2.285	25.6	7.7 76.4E
2010	6 10	10 36.01	+16 12.8	2.311	2.284	25.5	7.8 75.8E
2010	6 11	10 37.32	+16 3.5	2.322	2.284	25.5	7.8 75.2E
2010	6 12	10 38.64	+15 54.2	2.332	2.283	25.4	7.8 74.6E

Date			R.A.2000	Decl.2000	Delta	r	Phase	Mag	Elong.
year	mo	day	hh mm.mm	dd pp.p	A.U.	A.U.	°	V	°
2010	6	13	10 39.97	+15 44.7	2.343	2.282	25.3	7.8	74.0E
2010	6	14	10 41.31	+15 35.2	2.353	2.281	25.3	7.8	73.4E
2010	6	15	10 42.66	+15 25.7	2.363	2.280	25.2	7.8	72.8E
2010	6	16	10 44.02	+15 16.0	2.374	2.279	25.1	7.8	72.2E
2010	6	17	10 45.39	+15 6.3	2.384	2.278	25.0	7.8	71.6E
2010	6	18	10 46.77	+14 56.5	2.394	2.277	25.0	7.8	71.0E
2010	6	19	10 48.15	+14 46.6	2.404	2.276	24.9	7.8	70.5E
2010	6	20	10 49.55	+14 36.7	2.415	2.275	24.8	7.8	69.9E
2010	6	21	10 50.95	+14 26.7	2.425	2.274	24.7	7.8	69.3E
2010	6	22	10 52.37	+14 16.7	2.435	2.273	24.6	7.8	68.8E
2010	6	23	10 53.79	+14 6.5	2.445	2.272	24.5	7.8	68.2E
2010	6	24	10 55.22	+13 56.3	2.455	2.271	24.4	7.8	67.6E
2010	6	25	10 56.66	+13 46.1	2.464	2.270	24.4	7.9	67.1E
2010	6	26	10 58.11	+13 35.8	2.474	2.269	24.3	7.9	66.5E
2010	6	27	10 59.56	+13 25.4	2.484	2.268	24.2	7.9	66.0E
2010	6	28	11 1.02	+13 14.9	2.494	2.267	24.1	7.9	65.4E
2010	6	29	11 2.49	+13 4.4	2.503	2.267	24.0	7.9	64.9E
2010	6	30	11 3.97	+12 53.9	2.513	2.266	23.8	7.9	64.3E
2010	7	1	11 5.45	+12 43.2	2.523	2.265	23.7	7.9	63.8E
2010	7	2	11 6.94	+12 32.6	2.532	2.264	23.6	7.9	63.2E
2010	7	3	11 8.44	+12 21.8	2.542	2.263	23.5	7.9	62.7E
2010	7	4	11 9.95	+12 11.0	2.551	2.262	23.4	7.9	62.1E
2010	7	5	11 11.46	+12 0.2	2.560	2.261	23.3	7.9	61.6E
2010	7	6	11 12.98	+11 49.3	2.570	2.260	23.2	7.9	61.1E
2010	7	7	11 14.50	+11 38.3	2.579	2.259	23.1	7.9	60.5E
2010	7	8	11 16.04	+11 27.3	2.588	2.258	22.9	7.9	60.0E
2010	7	9	11 17.57	+11 16.3	2.597	2.257	22.8	7.9	59.5E
2010	7	10	11 19.12	+11 5.1	2.606	2.256	22.7	7.9	58.9E
2010	7	11	11 20.67	+10 54.0	2.615	2.256	22.6	7.9	58.4E
2010	7	12	11 22.22	+10 42.8	2.624	2.255	22.5	7.9	57.9E
2010	7	13	11 23.79	+10 31.5	2.633	2.254	22.3	7.9	57.4E
2010	7	14	11 25.35	+10 20.2	2.642	2.253	22.2	7.9	56.8E
2010	7	15	11 26.93	+10 8.8	2.651	2.252	22.1	7.9	56.3E
2010	7	16	11 28.51	+ 9 57.4	2.659	2.251	21.9	7.9	55.8E
2010	7	17	11 30.09	+ 9 46.0	2.668	2.250	21.8	7.9	55.3E
2010	7	18	11 31.68	+ 9 34.5	2.676	2.249	21.7	7.9	54.8E
2010	7	19	11 33.28	+ 9 23.0	2.685	2.248	21.5	7.9	54.3E
2010	7	20	11 34.88	+ 9 11.4	2.693	2.248	21.4	7.9	53.8E
2010	7	21	11 36.49	+ 8 59.8	2.702	2.247	21.2	7.9	53.3E
2010	7	22	11 38.10	+ 8 48.1	2.710	2.246	21.1	8.0	52.8E
2010	7	23	11 39.72	+ 8 36.4	2.718	2.245	21.0	8.0	52.2E
2010	7	24	11 41.34	+ 8 24.7	2.727	2.244	20.8	8.0	51.7E
2010	7	25	11 42.97	+ 8 12.9	2.735	2.243	20.7	8.0	51.2E
2010	7	26	11 44.60	+ 8 1.1	2.743	2.242	20.5	8.0	50.7E
2010	7	27	11 46.24	+ 7 49.2	2.751	2.241	20.4	8.0	50.2E
2010	7	28	11 47.88	+ 7 37.3	2.759	2.241	20.2	8.0	49.7E
2010	7	29	11 49.53	+ 7 25.4	2.766	2.240	20.1	8.0	49.2E
2010	7	30	11 51.18	+ 7 13.5	2.774	2.239	19.9	8.0	48.7E
2010	7	31	11 52.84	+ 7 1.5	2.782	2.238	19.8	8.0	48.3E
2010	8	1	11 54.50	+ 6 49.5	2.790	2.237	19.6	8.0	47.8E
2010	8	2	11 56.17	+ 6 37.4	2.797	2.236	19.5	8.0	47.3E
2010	8	3	11 57.84	+ 6 25.3	2.805	2.235	19.3	8.0	46.8E
2010	8	4	11 59.52	+ 6 13.2	2.812	2.235	19.2	8.0	46.3E
2010	8	5	12 1.20	+ 6 1.1	2.819	2.234	19.0	8.0	45.8E
2010	8	6	12 2.88	+ 5 48.9	2.827	2.233	18.8	8.0	45.3E
2010	8	7	12 4.57	+ 5 36.8	2.834	2.232	18.7	8.0	44.8E
2010	8	8	12 6.26	+ 5 24.5	2.841	2.231	18.5	8.0	44.3E
2010	8	9	12 7.96	+ 5 12.3	2.848	2.230	18.4	8.0	43.9E
2010	8	10	12 9.66	+ 5 0.1	2.855	2.230	18.2	8.0	43.4E
2010	8	11	12 11.37	+ 4 47.8	2.862	2.229	18.0	8.0	42.9E
2010	8	12	12 13.08	+ 4 35.5	2.869	2.228	17.9	8.0	42.4E
2010	8	13	12 14.80	+ 4 23.2	2.876	2.227	17.7	8.0	41.9E
2010	8	14	12 16.52	+ 4 10.8	2.882	2.226	17.5	8.0	41.4E
2010	8	15	12 18.24	+ 3 58.5	2.889	2.226	17.4	8.0	41.0E
2010	8	16	12 19.97	+ 3 46.1	2.896	2.225	17.2	8.0	40.5E
2010	8	17	12 21.70	+ 3 33.7	2.902	2.224	17.0	8.0	40.0E
2010	8	18	12 23.44	+ 3 21.3	2.908	2.223	16.9	8.0	39.5E
2010	8	19	12 25.18	+ 3 8.9	2.915	2.222	16.7	8.0	39.1E
2010	8	20	12 26.93	+ 2 56.4	2.921	2.222	16.5	8.0	38.6E
2010	8	21	12 28.68	+ 2 44.0	2.927	2.221	16.3	8.0	38.1E
2010	8	22	12 30.43	+ 2 31.5	2.933	2.220	16.2	8.0	37.6E
2010	8	23	12 32.19	+ 2 19.1	2.939	2.219	16.0	8.0	37.2E
2010	8	24	12 33.95	+ 2 6.6	2.945	2.218	15.8	8.0	36.7E
2010	8	25	12 35.72	+ 1 54.1	2.951	2.218	15.6	8.0	36.2E
2010	8	26	12 37.49	+ 1 41.6	2.957	2.217	15.5	8.0	35.8E
2010	8	27	12 39.26	+ 1 29.1	2.963	2.216	15.3	8.0	35.3E
2010	8	28	12 41.04	+ 1 16.6	2.968	2.215	15.1	8.0	34.8E
2010	8	29	12 42.82	+ 1 4.1	2.974	2.215	14.9	8.0	34.4E
2010	8	30	12 44.61	+ 0 51.6	2.979	2.214	14.7	8.0	33.9E
2010	8	31	12 46.40	+ 0 39.1	2.985	2.213	14.6	8.0	33.4E
2010	9	1	12 48.20	+ 0 26.6	2.990	2.212	14.4	7.9	33.0E
2010	9	2	12 50.00	+ 0 14.1	2.995	2.212	14.2	7.9	32.5E
2010	9	3	12 51.80	+ 0 1.5	3.000	2.211	14.0	7.9	32.0E
2010	9	4	12 53.61	- 0 11.0	3.006	2.210	13.8	7.9	31.6E
2010	9	5	12 55.42	- 0 23.5	3.011	2.209	13.6	7.9	31.1E
2010	9	6	12 57.24	- 0 36.0	3.016	2.209	13.4	7.9	30.6E
2010	9	7	12 59.06	- 0 48.5	3.020	2.208	13.3	7.9	30.2E
2010	9	8	13 0.88	- 1 1	3.025	2.207	13.1	7.9	29.7E
2010	9	9	13 2.71	- 1 13.4	3.030	2.206	12.9	7.9	29.2E
2010	9	10	13 4.54	- 1 25.9	3.034	2.206	12.7	7.9	28.8E
2010	9	11	13 6.38	- 1 38.4	3.039	2.205	12.5	7.9	28.3E

Date	R.A.2000	Decl.2000	Delta	r	Phase	Mag	Elong.
year mo day	hh mm.mm	dd pp.p	A.U.	A.U.	ø	V	ø
2010 9 12	13 8.22	- 1 50.8	3.043	2.204	12.3	7.9	27.9E
2010 9 13	13 10.06	- 2 3.3	3.048	2.204	12.1	7.9	27.4E
2010 9 14	13 11.91	- 2 15.7	3.052	2.203	11.9	7.9	26.9E
2010 9 15	13 13.77	- 2 28.1	3.056	2.202	11.7	7.9	26.5E
2010 9 16	13 15.62	- 2 40.5	3.060	2.201	11.6	7.9	26.0E
2010 9 17	13 17.49	- 2 52.9	3.064	2.201	11.4	7.9	25.6E
2010 9 18	13 19.35	- 3 5.2	3.068	2.200	11.2	7.9	25.1E
2010 9 19	13 21.22	- 3 17.6	3.072	2.199	11.0	7.9	24.6E
2010 9 20	13 23.10	- 3 29.9	3.076	2.199	10.8	7.9	24.2E
2010 9 21	13 24.97	- 3 42.2	3.080	2.198	10.6	7.9	23.7E
2010 9 22	13 26.86	- 3 54.5	3.083	2.197	10.4	7.9	23.3E
2010 9 23	13 28.74	- 4 6.8	3.087	2.197	10.2	7.9	22.8E
2010 9 24	13 30.64	- 4 19.0	3.090	2.196	10.0	7.9	22.4E
2010 9 25	13 32.53	- 4 31.2	3.094	2.195	9.8	7.9	21.9E
2010 9 26	13 34.43	- 4 43.4	3.097	2.195	9.6	7.9	21.5E
2010 9 27	13 36.33	- 4 55.5	3.100	2.194	9.4	7.9	21.0E
2010 9 28	13 38.24	- 5 7.7	3.103	2.193	9.2	7.9	20.5E
2010 9 29	13 40.16	- 5 19.8	3.106	2.193	9.0	7.8	20.1E
2010 9 30	13 42.07	- 5 31.8	3.109	2.192	8.8	7.8	19.6E
2010 10 1	13 43.99	- 5 43.9	3.112	2.191	8.6	7.8	19.2E
2010 10 2	13 45.92	- 5 55.9	3.115	2.191	8.4	7.8	18.7E
2010 10 3	13 47.85	- 6 7.8	3.118	2.190	8.2	7.8	18.3E
2010 10 4	13 49.78	- 6 19.7	3.120	2.190	8.0	7.8	17.8E
2010 10 5	13 51.72	- 6 31.6	3.123	2.189	7.8	7.8	17.4E
2010 10 6	13 53.66	- 6 43.5	3.125	2.188	7.6	7.8	16.9E
2010 10 7	13 55.61	- 6 55.3	3.128	2.188	7.5	7.8	16.5E
2010 10 8	13 57.56	- 7 7.1	3.130	2.187	7.3	7.8	16.0E
2010 10 9	13 59.52	- 7 18.8	3.132	2.187	7.1	7.8	15.6E
2010 10 10	14 1.48	- 7 30.5	3.134	2.186	6.9	7.8	15.1E
2010 10 11	14 3.44	- 7 42.1	3.136	2.185	6.7	7.8	14.7E
2010 10 12	14 5.41	- 7 53.7	3.138	2.185	6.5	7.8	14.3E
2010 10 13	14 7.38	- 8 5.3	3.140	2.184	6.3	7.8	13.8E
2010 10 14	14 9.36	- 8 16.8	3.142	2.184	6.1	7.8	13.4E
2010 10 15	14 11.34	- 8 28.3	3.144	2.183	5.9	7.8	12.9E
2010 10 16	14 13.33	- 8 39.7	3.145	2.182	5.7	7.7	12.5E
2010 10 17	14 15.32	- 8 51.0	3.147	2.182	5.5	7.7	12.1E
2010 10 18	14 17.31	- 9 2.3	3.148	2.181	5.3	7.7	11.6E
2010 10 19	14 19.31	- 9 13.6	3.149	2.181	5.1	7.7	11.2E
2010 10 20	14 21.31	- 9 24.8	3.151	2.180	4.9	7.7	10.8E
2010 10 21	14 23.32	- 9 35.9	3.152	2.180	4.7	7.7	10.3E
2010 10 22	14 25.33	- 9 47.0	3.153	2.179	4.5	7.7	9.9E
2010 10 23	14 27.35	- 9 58.0	3.154	2.179	4.3	7.7	9.5E
2010 10 24	14 29.37	-10 9.0	3.155	2.178	4.1	7.7	9.1E
2010 10 25	14 31.39	-10 19.9	3.156	2.178	3.9	7.7	8.7E
2010 10 26	14 33.42	-10 30.7	3.156	2.177	3.8	7.7	8.3E
2010 10 27	14 35.46	-10 41.5	3.157	2.176	3.6	7.7	7.9E
2010 10 28	14 37.49	-10 52.2	3.157	2.176	3.4	7.6	7.5E
2010 10 29	14 39.54	-11 2.9	3.158	2.175	3.2	7.6	7.1E
2010 10 30	14 41.58	-11 13.5	3.158	2.175	3.1	7.6	6.7E
2010 10 31	14 43.63	-11 24.0	3.159	2.174	2.9	7.6	6.3E
2010 11 1	14 45.69	-11 34.5	3.159	2.174	2.7	7.6	6.0E
2010 11 2	14 47.75	-11 44.8	3.159	2.173	2.6	7.6	5.7E
2010 11 3	14 49.81	-11 55.1	3.159	2.173	2.4	7.6	5.3E
2010 11 4	14 51.88	-12 5.4	3.159	2.173	2.3	7.6	5.1E
2010 11 5	14 53.95	-12 15.6	3.159	2.172	2.2	7.6	4.8E
2010 11 6	14 56.03	-12 25.6	3.158	2.172	2.1	7.6	4.6E
2010 11 7	14 58.11	-12 35.7	3.158	2.171	2.0	7.6	4.4E
2010 11 8	15 0.19	-12 45.6	3.158	2.171	1.9	7.6	4.2E
2010 11 9	15 2.28	-12 55.5	3.157	2.170	1.9	7.6	4.1E
2010 11 10	15 4.37	-13 5.3	3.156	2.170	1.9	7.6	4.1E
2010 11 11	15 6.47	-13 15.0	3.156	2.169	1.9	7.6	4.1E
2010 11 12	15 8.57	-13 24.6	3.155	2.169	1.9	7.6	4.2E
2010 11 13	15 10.67	-13 34.1	3.154	2.168	1.9	7.6	4.3W
2010 11 14	15 12.78	-13 43.6	3.153	2.168	2.0	7.6	4.4W
2010 11 15	15 14.89	-13 53.0	3.152	2.168	2.1	7.6	4.6W
2010 11 16	15 17.01	-14 2.2	3.151	2.167	2.2	7.6	4.9W
2010 11 17	15 19.13	-14 11.5	3.150	2.167	2.3	7.6	5.1W
2010 11 18	15 21.25	-14 20.6	3.148	2.166	2.5	7.6	5.4W
2010 11 19	15 23.38	-14 29.6	3.147	2.166	2.6	7.6	5.8W
2010 11 20	15 25.51	-14 38.5	3.146	2.166	2.8	7.6	6.1W
2010 11 21	15 27.64	-14 47.4	3.144	2.165	2.9	7.6	6.5W
2010 11 22	15 29.78	-14 56.2	3.142	2.165	3.1	7.6	6.8W
2010 11 23	15 31.92	-15 4.8	3.141	2.164	3.3	7.6	7.2W
2010 11 24	15 34.07	-15 13.4	3.139	2.164	3.5	7.6	7.6W
2010 11 25	15 36.22	-15 21.9	3.137	2.164	3.6	7.6	8.0W
2010 11 26	15 38.37	-15 30.3	3.135	2.163	3.8	7.6	8.4W
2010 11 27	15 40.53	-15 38.5	3.133	2.163	4.0	7.6	8.8W
2010 11 28	15 42.69	-15 46.7	3.130	2.163	4.2	7.7	9.3W
2010 11 29	15 44.85	-15 54.8	3.128	2.162	4.4	7.7	9.7W
2010 11 30	15 47.02	-16 2.8	3.126	2.162	4.6	7.7	10.1W
2010 12 1	15 49.18	-16 10.7	3.123	2.161	4.8	7.7	10.5W
2010 12 2	15 51.36	-16 18.5	3.121	2.161	5.0	7.7	11.0W
2010 12 3	15 53.53	-16 26.2	3.118	2.161	5.2	7.7	11.4W
2010 12 4	15 55.71	-16 33.8	3.115	2.160	5.4	7.7	11.9W
2010 12 5	15 57.89	-16 41.3	3.113	2.160	5.6	7.7	12.3W
2010 12 6	16 0.08	-16 48.7	3.110	2.160	5.8	7.7	12.8W
2010 12 7	16 2.26	-16 56.0	3.107	2.160	6.0	7.7	13.2W
2010 12 8	16 4.45	-17 3.1	3.104	2.159	6.2	7.7	13.7W
2010 12 9	16 6.64	-17 10.2	3.101	2.159	6.4	7.7	14.1W
2010 12 10	16 8.84	-17 17.2	3.097	2.159	6.6	7.7	14.6W
2010 12 11	16 11.04	-17 24.0	3.094	2.158	6.8	7.7	15.1W

## 4 Vesta

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase °	Mag V	Elong. °
2010 12 12	16 13.24	-17 30.8	3.091	2.158	7.0	7.7	15.5W
2010 12 13	16 15.44	-17 37.4	3.087	2.158	7.2	7.7	16.0W
2010 12 14	16 17.64	-17 44.0	3.084	2.158	7.4	7.7	16.4W
2010 12 15	16 19.85	-17 50.4	3.080	2.157	7.6	7.7	16.9W
2010 12 16	16 22.06	-17 56.7	3.076	2.157	7.8	7.8	17.4W
2010 12 17	16 24.27	-18 2.9	3.072	2.157	8.0	7.8	17.8W
2010 12 18	16 26.48	-18 9.0	3.068	2.156	8.2	7.8	18.3W
2010 12 19	16 28.70	-18 15.0	3.064	2.156	8.5	7.8	18.8W
2010 12 20	16 30.91	-18 20.8	3.060	2.156	8.7	7.8	19.3W
2010 12 21	16 33.13	-18 26.6	3.056	2.156	8.9	7.8	19.7W
2010 12 22	16 35.35	-18 32.2	3.052	2.156	9.1	7.8	20.2W
2010 12 23	16 37.57	-18 37.7	3.047	2.155	9.3	7.8	20.7W
2010 12 24	16 39.79	-18 43.1	3.043	2.155	9.5	7.8	21.2W
2010 12 25	16 42.02	-18 48.4	3.038	2.155	9.7	7.8	21.6W
2010 12 26	16 44.24	-18 53.6	3.034	2.155	9.9	7.8	22.1W
2010 12 27	16 46.47	-18 58.7	3.029	2.154	10.1	7.8	22.6W
2010 12 28	16 48.69	-19 3.6	3.024	2.154	10.3	7.8	23.1W
2010 12 29	16 50.92	-19 8.4	3.020	2.154	10.5	7.8	23.5W
2010 12 30	16 53.15	-19 13.2	3.015	2.154	10.7	7.8	24.0W
2010 12 31	16 55.38	-19 17.8	3.010	2.154	10.9	7.8	24.5W

## 6 Hebe

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase °	Mag V	Elong. °
2010 7 21	0 14.66	- 5 7.9	1.357	2.026	26.7	9.0	116.5W
2010 7 22	0 15.61	- 5 13.5	1.347	2.025	26.5	9.0	117.3W
2010 7 23	0 16.54	- 5 19.3	1.336	2.023	26.3	8.9	118.0W
2010 7 24	0 17.44	- 5 25.4	1.326	2.022	26.1	8.9	118.8W
2010 7 25	0 18.33	- 5 31.8	1.315	2.020	25.9	8.9	119.6W
2010 7 26	0 19.20	- 5 38.5	1.305	2.019	25.7	8.9	120.4W
2010 7 27	0 20.04	- 5 45.5	1.295	2.017	25.5	8.8	121.2W
2010 7 28	0 20.86	- 5 52.7	1.285	2.016	25.3	8.8	121.9W
2010 7 29	0 21.66	- 6 0.3	1.275	2.014	25.1	8.8	122.7W
2010 7 30	0 22.43	- 6 8.1	1.265	2.013	24.9	8.8	123.5W
2010 7 31	0 23.18	- 6 16.3	1.256	2.011	24.6	8.7	124.4W
2010 8 1	0 23.91	- 6 24.7	1.246	2.010	24.4	8.7	125.2W
2010 8 2	0 24.61	- 6 33.5	1.237	2.009	24.1	8.7	126.0W
2010 8 3	0 25.28	- 6 42.5	1.227	2.007	23.9	8.7	126.8W
2010 8 4	0 25.93	- 6 51.9	1.218	2.006	23.6	8.6	127.6W
2010 8 5	0 26.56	- 7 1.5	1.209	2.004	23.3	8.6	128.5W
2010 8 6	0 27.16	- 7 11.5	1.200	2.003	23.1	8.6	129.3W
2010 8 7	0 27.73	- 7 21.7	1.191	2.002	22.8	8.6	130.2W
2010 8 8	0 28.27	- 7 32.3	1.183	2.000	22.5	8.5	131.0W
2010 8 9	0 28.79	- 7 43.1	1.174	1.999	22.2	8.5	131.9W
2010 8 10	0 29.27	- 7 54.2	1.166	1.997	21.9	8.5	132.7W
2010 8 11	0 29.73	- 8 5.7	1.157	1.996	21.6	8.5	133.6W
2010 8 12	0 30.17	- 8 17.4	1.149	1.995	21.3	8.4	134.5W
2010 8 13	0 30.57	- 8 29.4	1.141	1.994	20.9	8.4	135.3W
2010 8 14	0 30.94	- 8 41.6	1.133	1.992	20.6	8.4	136.2W
2010 8 15	0 31.29	- 8 54.2	1.126	1.991	20.3	8.4	137.1W
2010 8 16	0 31.60	- 9 7.0	1.118	1.990	19.9	8.3	138.0W
2010 8 17	0 31.89	- 9 20.1	1.111	1.988	19.6	8.3	138.9W
2010 8 18	0 32.14	- 9 33.5	1.104	1.987	19.2	8.3	139.8W
2010 8 19	0 32.37	- 9 47.1	1.097	1.986	18.9	8.3	140.6W
2010 8 20	0 32.56	-10 0.9	1.090	1.985	18.5	8.2	141.5W
2010 8 21	0 32.72	-10 15.0	1.083	1.984	18.1	8.2	142.4W
2010 8 22	0 32.86	-10 29.3	1.077	1.982	17.7	8.2	143.3W
2010 8 23	0 32.96	-10 43.9	1.071	1.981	17.4	8.2	144.2W
2010 8 24	0 33.03	-10 58.6	1.065	1.980	17.0	8.1	145.1W
2010 8 25	0 33.07	-11 13.6	1.059	1.979	16.6	8.1	146.0W
2010 8 26	0 33.08	-11 28.7	1.053	1.978	16.2	8.1	146.9W
2010 8 27	0 33.06	-11 44.0	1.047	1.977	15.8	8.1	147.7W
2010 8 28	0 33.01	-11 59.5	1.042	1.976	15.5	8.0	148.6W
2010 8 29	0 32.93	-12 15.1	1.037	1.974	15.1	8.0	149.5W
2010 8 30	0 32.82	-12 30.9	1.032	1.973	14.7	8.0	150.3W
2010 8 31	0 32.68	-12 46.8	1.027	1.972	14.3	8.0	151.1W
2010 9 1	0 32.51	-13 2.8	1.022	1.971	13.9	7.9	152.0W
2010 9 2	0 32.31	-13 18.9	1.018	1.970	13.5	7.9	152.8W
2010 9 3	0 32.08	-13 35.1	1.014	1.969	13.2	7.9	153.6W
2010 9 4	0 31.82	-13 51.3	1.010	1.968	12.8	7.9	154.3W
2010 9 5	0 31.54	-14 7.6	1.006	1.967	12.5	7.9	155.1W
2010 9 6	0 31.23	-14 23.9	1.003	1.966	12.1	7.8	155.8W
2010 9 7	0 30.89	-14 40.2	1.00	1.965	11.8	7.8	156.5W
2010 9 8	0 30.53	-14 56.6	0.996	1.964	11.5	7.8	157.2W
2010 9 9	0 30.14	-15 12.8	0.994	1.963	11.2	7.8	157.8W
2010 9 10	0 29.73	-15 29.1	0.991	1.962	10.9	7.8	158.3W
2010 9 11	0 29.30	-15 45.3	0.989	1.962	10.7	7.7	158.9W
2010 9 12	0 28.84	-16 1.4	0.986	1.961	10.4	7.7	159.4W
2010 9 13	0 28.36	-16 17.3	0.984	1.960	10.2	7.7	159.8W
2010 9 14	0 27.86	-16 33.2	0.983	1.959	10.0	7.7	160.2W
2010 9 15	0 27.35	-16 48.9	0.981	1.958	9.9	7.7	160.5W
2010 9 16	0 26.81	-17 4.5	0.980	1.957	9.8	7.7	160.7W
2010 9 17	0 26.26	-17 19.9	0.979	1.956	9.7	7.7	160.9W
2010 9 18	0 25.69	-17 35.1	0.978	1.956	9.6	7.7	161.0W
2010 9 19	0 25.10	-17 50.0	0.977	1.955	9.6	7.7	161.0W
2010 9 20	0 24.51	-18 4.8	0.977	1.954	9.6	7.7	161.0W
2010 9 21	0 23.90	-18 19.3	0.977	1.953	9.7	7.7	160.9W

## 6 Hebe

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2010 9 21	0 23.90	-18 19.3	0.977	1.953	9.7	7.7	160.9W
2010 9 22	0 23.28	-18 33.5	0.977	1.952	9.8	7.7	160.7W
2010 9 23	0 22.65	-18 47.4	0.977	1.952	9.9	7.7	160.4W
2010 9 24	0 22.02	-19 1.0	0.977	1.951	10.1	7.7	160.1W
2010 9 25	0 21.37	-19 14.3	0.978	1.950	10.3	7.7	159.7W
2010 9 26	0 20.73	-19 27.3	0.979	1.950	10.5	7.7	159.3W
2010 9 27	0 20.08	-19 39.9	0.980	1.949	10.7	7.7	158.8W
2010 9 28	0 19.42	-19 52.2	0.982	1.948	11.0	7.7	158.3W
2010 9 29	0 18.77	-20 4.0	0.983	1.948	11.3	7.7	157.7E
2010 9 30	0 18.12	-20 15.5	0.985	1.947	11.6	7.8	157.1E
2010 10 1	0 17.47	-20 26.6	0.987	1.946	11.9	7.8	156.4E
2010 10 2	0 16.83	-20 37.3	0.989	1.946	12.2	7.8	155.7E
2010 10 3	0 16.19	-20 47.6	0.992	1.945	12.6	7.8	155.0E
2010 10 4	0 15.55	-20 57.4	0.994	1.945	12.9	7.8	154.2E
2010 10 5	0 14.93	-21 6.9	0.997	1.944	13.3	7.8	153.5E
2010 10 6	0 14.32	-21 15.8	1.000	1.944	13.7	7.9	152.7E
2010 10 7	0 13.71	-21 24.3	1.003	1.943	14.0	7.9	151.9E
2010 10 8	0 13.12	-21 32.4	1.007	1.942	14.4	7.9	151.0E
2010 10 9	0 12.55	-21 40.0	1.011	1.942	14.8	7.9	150.2E
2010 10 10	0 11.99	-21 47.2	1.014	1.942	15.2	7.9	149.3E
2010 10 11	0 11.44	-21 53.8	1.018	1.941	15.6	7.9	148.5E
2010 10 12	0 10.92	-22 0.1	1.023	1.941	16.0	8.0	147.6E
2010 10 13	0 10.41	-22 5.8	1.027	1.940	16.4	8.0	146.7E
2010 10 14	0 9.92	-22 11.1	1.032	1.940	16.8	8.0	145.9E
2010 10 15	0 9.45	-22 15.9	1.036	1.939	17.2	8.0	145.0E
2010 10 16	0 9.01	-22 20.2	1.041	1.939	17.6	8.1	144.1E
2010 10 17	0 8.58	-22 24.1	1.046	1.939	17.9	8.1	143.2E
2010 10 18	0 8.19	-22 27.5	1.052	1.938	18.3	8.1	142.3E
2010 10 19	0 7.81	-22 30.5	1.057	1.938	18.7	8.1	141.4E
2010 10 20	0 7.46	-22 33.0	1.063	1.938	19.1	8.1	140.5E
2010 10 21	0 7.14	-22 35.0	1.068	1.937	19.4	8.2	139.6E
2010 10 22	0 6.84	-22 36.6	1.074	1.937	19.8	8.2	138.7E
2010 10 23	0 6.58	-22 37.8	1.080	1.937	20.2	8.2	137.8E
2010 10 24	0 6.34	-22 38.5	1.086	1.936	20.5	8.2	137.0E
2010 10 25	0 6.12	-22 38.8	1.093	1.936	20.9	8.3	136.1E
2010 10 26	0 5.94	-22 38.6	1.099	1.936	21.2	8.3	135.2E
2010 10 27	0 5.79	-22 38.0	1.106	1.936	21.5	8.3	134.3E
2010 10 28	0 5.66	-22 37.1	1.113	1.936	21.9	8.3	133.5E
2010 10 29	0 5.57	-22 35.7	1.120	1.935	22.2	8.3	132.6E
2010 10 30	0 5.51	-22 33.9	1.127	1.935	22.5	8.4	131.7E
2010 10 31	0 5.48	-22 31.7	1.134	1.935	22.8	8.4	130.9E
2010 11 1	0 5.47	-22 29.1	1.141	1.935	23.1	8.4	130.0E
2010 11 2	0 5.50	-22 26.1	1.148	1.935	23.4	8.4	129.2E
2010 11 3	0 5.56	-22 22.8	1.156	1.935	23.7	8.5	128.3E
2010 11 4	0 5.65	-22 19.1	1.164	1.935	24.0	8.5	127.5E
2010 11 5	0 5.78	-22 15.0	1.171	1.935	24.3	8.5	126.7E
2010 11 6	0 5.93	-22 10.6	1.179	1.935	24.5	8.5	125.8E
2010 11 7	0 6.11	-22 5.8	1.187	1.934	24.8	8.5	125.0E
2010 11 8	0 6.33	-22 0.7	1.195	1.934	25.1	8.6	124.2E
2010 11 9	0 6.57	-21 55.3	1.203	1.934	25.3	8.6	123.4E
2010 11 10	0 6.85	-21 49.5	1.212	1.934	25.5	8.6	122.6E
2010 11 11	0 7.16	-21 43.4	1.220	1.934	25.8	8.6	121.8E
2010 11 12	0 7.49	-21 37.1	1.228	1.935	26.0	8.6	121.0E
2010 11 13	0 7.86	-21 30.4	1.237	1.935	26.2	8.7	120.2E
2010 11 14	0 8.25	-21 23.4	1.246	1.935	26.4	8.7	119.5E
2010 11 15	0 8.68	-21 16.2	1.254	1.935	26.6	8.7	118.7E
2010 11 16	0 9.14	-21 8.7	1.263	1.935	26.8	8.7	117.9E
2010 11 17	0 9.62	-21 0.9	1.272	1.935	27.0	8.7	117.2E
2010 11 18	0 10.13	-20 52.8	1.281	1.935	27.2	8.8	116.4E
2010 11 19	0 10.67	-20 44.5	1.290	1.935	27.4	8.8	115.7E
2010 11 20	0 11.24	-20 35.9	1.299	1.935	27.6	8.8	114.9E
2010 11 21	0 11.84	-20 27.1	1.308	1.936	27.8	8.8	114.2E
2010 11 22	0 12.46	-20 18.0	1.318	1.936	27.9	8.9	113.4E
2010 11 23	0 13.11	-20 8.8	1.327	1.936	28.1	8.9	112.7E
2010 11 24	0 13.79	-19 59.3	1.336	1.936	28.2	8.9	112.0E
2010 11 25	0 14.49	-19 49.5	1.346	1.937	28.4	8.9	111.3E
2010 11 26	0 15.22	-19 39.6	1.355	1.937	28.5	8.9	110.6E
2010 11 27	0 15.98	-19 29.5	1.365	1.937	28.6	8.9	109.9E
2010 11 28	0 16.76	-19 19.1	1.375	1.937	28.8	9.0	109.2E
2010 11 29	0 17.56	-19 8.6	1.384	1.938	28.9	9.0	108.5E

## 7 Iris

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2010 11 27	8 49.88	+14 18.6	1.412	2.019	26.6	9.0	113.5W
2010 11 28	8 50.32	+14 12.6	1.404	2.021	26.4	9.0	114.4W
2010 11 29	8 50.72	+14 6.7	1.396	2.024	26.2	9.0	115.3W
2010 11 30	8 51.08	+14 0.8	1.388	2.026	25.9	8.9	116.2W
2010 12 1	8 51.41	+13 55.1	1.380	2.028	25.7	8.9	117.1W
2010 12 2	8 51.70	+13 49.5	1.372	2.031	25.4	8.9	118.0W
2010 12 3	8 51.96	+13 44.1	1.364	2.033	25.1	8.9	118.9W
2010 12 4	8 52.18	+13 38.7	1.357	2.035	24.8	8.9	119.8W
2010 12 5	8 52.37	+13 33.5	1.349	2.038	24.6	8.8	120.8W
2010 12 6	8 52.51	+13 28.4	1.342	2.040	24.3	8.8	121.7W
2010 12 7	8 52.62	+13 23.4	1.334	2.042	24.0	8.8	122.7W
2010 12 8	8 52.70	+13 18.5	1.327	2.045	23.6	8.8	123.7W
2010 12 9	8 52.73	+13 13.8	1.320	2.047	23.3	8.8	124.6W

## 7 Iris

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2010 12 10	8 52.73	+13 9.2	1.313	2.050	23.0	8.8	125.6W
2010 12 11	8 52.69	+13 4.8	1.306	2.052	22.7	8.7	126.6W
2010 12 12	8 52.61	+13 0.5	1.299	2.054	22.3	8.7	127.6W
2010 12 13	8 52.50	+12 56.4	1.293	2.057	22.0	8.7	128.6W
2010 12 14	8 52.35	+12 52.4	1.286	2.059	21.6	8.7	129.7W
2010 12 15	8 52.16	+12 48.5	1.280	2.062	21.2	8.7	130.7W
2010 12 16	8 51.93	+12 44.8	1.274	2.064	20.8	8.6	131.7W
2010 12 17	8 51.66	+12 41.2	1.268	2.066	20.5	8.6	132.8W
2010 12 18	8 51.36	+12 37.8	1.262	2.069	20.1	8.6	133.9W
2010 12 19	8 51.02	+12 34.6	1.256	2.071	19.7	8.6	134.9W
2010 12 20	8 50.64	+12 31.5	1.250	2.074	19.2	8.6	136.0W
2010 12 21	8 50.23	+12 28.5	1.245	2.076	18.8	8.5	137.1W
2010 12 22	8 49.78	+12 25.8	1.239	2.079	18.4	8.5	138.2W
2010 12 23	8 49.29	+12 23.1	1.234	2.081	18.0	8.5	139.3W
2010 12 24	8 48.77	+12 20.7	1.229	2.084	17.5	8.5	140.4W
2010 12 25	8 48.22	+12 18.4	1.224	2.086	17.1	8.4	141.5W
2010 12 26	8 47.62	+12 16.2	1.220	2.088	16.6	8.4	142.6W
2010 12 27	8 47.00	+12 14.2	1.215	2.091	16.1	8.4	143.8W
2010 12 28	8 46.34	+12 12.4	1.211	2.093	15.7	8.4	144.9W
2010 12 29	8 45.65	+12 10.7	1.207	2.096	15.2	8.4	146.1W
2010 12 30	8 44.93	+12 9.2	1.203	2.098	14.7	8.3	147.2W
2010 12 31	8 44.18	+12 7.9	1.199	2.101	14.2	8.3	148.4W

## 8 Flora

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2010 8 9	23 49.68	- 9 22.2	1.097	1.994	18.4	9.0	141.6W
2010 8 10	23 49.62	- 9 28.9	1.089	1.992	18.0	9.0	142.6W
2010 8 11	23 49.53	- 9 35.8	1.082	1.990	17.6	8.9	143.6W
2010 8 12	23 49.41	- 9 42.8	1.074	1.989	17.2	8.9	144.6W
2010 8 13	23 49.26	- 9 50.1	1.067	1.987	16.7	8.9	145.6W
2010 8 14	23 49.07	- 9 57.5	1.060	1.986	16.3	8.8	146.6W
2010 8 15	23 48.85	-10 5.2	1.053	1.984	15.9	8.8	147.6W
2010 8 16	23 48.59	-10 13.0	1.047	1.983	15.4	8.8	148.6W
2010 8 17	23 48.31	-10 21.0	1.040	1.981	15.0	8.8	149.6W
2010 8 18	23 47.99	-10 29.1	1.034	1.979	14.5	8.7	150.6W
2010 8 19	23 47.64	-10 37.4	1.028	1.978	14.1	8.7	151.7W
2010 8 20	23 47.26	-10 45.9	1.022	1.976	13.6	8.7	152.7W
2010 8 21	23 46.85	-10 54.5	1.016	1.975	13.1	8.6	153.7W
2010 8 22	23 46.41	-11 3.2	1.011	1.973	12.6	8.6	154.7W
2010 8 23	23 45.94	-11 12.0	1.006	1.972	12.2	8.6	155.7W
2010 8 24	23 45.44	-11 21.0	1.000	1.970	11.7	8.6	156.8W
2010 8 25	23 44.91	-11 30.0	0.996	1.969	11.2	8.5	157.8W
2010 8 26	23 44.36	-11 39.2	0.991	1.967	10.7	8.5	158.8W
2010 8 27	23 43.77	-11 48.4	0.986	1.966	10.2	8.5	159.8W
2010 8 28	23 43.16	-11 57.7	0.982	1.964	9.7	8.5	160.8W
2010 8 29	23 42.52	-12 7.0	0.978	1.963	9.3	8.4	161.7W
2010 8 30	23 41.86	-12 16.4	0.974	1.961	8.8	8.4	162.7W
2010 8 31	23 41.18	-12 25.8	0.971	1.960	8.3	8.4	163.6W
2010 9 1	23 40.47	-12 35.2	0.967	1.958	7.9	8.3	164.5W
2010 9 2	23 39.74	-12 44.6	0.964	1.957	7.5	8.3	165.4W
2010 9 3	23 38.99	-12 54.0	0.961	1.956	7.1	8.3	166.2W
2010 9 4	23 38.22	-13 3.3	0.958	1.954	6.7	8.3	167.0W
2010 9 5	23 37.44	-13 12.7	0.956	1.953	6.3	8.3	167.7W
2010 9 6	23 36.63	-13 21.9	0.953	1.951	6.0	8.2	168.3W
2010 9 7	23 35.82	-13 31.1	0.951	1.950	5.7	8.2	168.9W
2010 9 8	23 34.98	-13 40.3	0.949	1.949	5.5	8.2	169.3W
2010 9 9	23 34.14	-13 49.3	0.948	1.947	5.4	8.2	169.6W
2010 9 10	23 33.29	-13 58.2	0.946	1.946	5.3	8.2	169.8W
2010 9 11	23 32.42	-14 6.9	0.945	1.944	5.3	8.2	169.8W
2010 9 12	23 31.55	-14 15.6	0.944	1.943	5.3	8.2	169.7W
2010 9 13	23 30.67	-14 24.1	0.944	1.942	5.5	8.2	169.4W
2010 9 14	23 29.79	-14 32.4	0.943	1.940	5.7	8.2	169.0W
2010 9 15	23 28.91	-14 40.5	0.943	1.939	5.9	8.2	168.5E
2010 9 16	23 28.02	-14 48.4	0.943	1.938	6.2	8.2	167.9E
2010 9 17	23 27.14	-14 56.2	0.943	1.936	6.6	8.2	167.2E
2010 9 18	23 26.26	-15 3.7	0.944	1.935	7.0	8.2	166.5E
2010 9 19	23 25.38	-15 11.0	0.944	1.934	7.4	8.2	165.7E
2010 9 20	23 24.51	-15 18.0	0.945	1.932	7.8	8.3	164.8E
2010 9 21	23 23.64	-15 24.8	0.946	1.931	8.3	8.3	163.9E
2010 9 22	23 22.79	-15 31.4	0.947	1.930	8.8	8.3	163.0E
2010 9 23	23 21.94	-15 37.7	0.949	1.929	9.3	8.3	162.0E
2010 9 24	23 21.11	-15 43.7	0.951	1.927	9.8	8.3	161.0E
2010 9 25	23 20.29	-15 49.4	0.953	1.926	10.3	8.4	160.0E
2010 9 26	23 19.49	-15 54.8	0.955	1.925	10.8	8.4	159.0E
2010 9 27	23 18.70	-15 60.0	0.957	1.924	11.3	8.4	157.9E
2010 9 28	23 17.93	-16 4.8	0.960	1.922	11.8	8.4	156.9E
2010 9 29	23 17.18	-16 9.3	0.963	1.921	12.3	8.4	155.9E
2010 9 30	23 16.46	-16 13.6	0.966	1.920	12.8	8.5	154.8E
2010 10 1	23 15.75	-16 17.5	0.969	1.919	13.3	8.5	153.8E
2010 10 2	23 15.07	-16 21.1	0.972	1.918	13.9	8.5	152.7E
2010 10 3	23 14.41	-16 24.3	0.976	1.916	14.4	8.5	151.6E
2010 10 4	23 13.78	-16 27.3	0.980	1.915	14.9	8.6	150.6E
2010 10 5	23 13.17	-16 29.9	0.984	1.914	15.4	8.6	149.5E
2010 10 6	23 12.60	-16 32.2	0.988	1.913	15.9	8.6	148.5E
2010 10 7	23 12.05	-16 34.1	0.992	1.912	16.3	8.6	147.4E
2010 10 8	23 11.53	-16 35.8	0.997	1.911	16.8	8.6	146.4E



## 8 Flora

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2010 10 9	23 11.04	-16 37.1	1.001	1.909	17.3	8.7	145.4E
2010 10 10	23 10.59	-16 38.1	1.006	1.908	17.8	8.7	144.3E
2010 10 11	23 10.16	-16 38.7	1.011	1.907	18.2	8.7	143.3E
2010 10 12	23 9.77	-16 39.1	1.016	1.906	18.7	8.7	142.3E
2010 10 13	23 9.41	-16 39.1	1.022	1.905	19.1	8.8	141.3E
2010 10 14	23 9.09	-16 38.8	1.027	1.904	19.6	8.8	140.2E
2010 10 15	23 8.80	-16 38.2	1.033	1.903	20.0	8.8	139.2E
2010 10 16	23 8.54	-16 37.3	1.038	1.902	20.4	8.8	138.2E
2010 10 17	23 8.32	-16 36.0	1.044	1.901	20.8	8.8	137.3E
2010 10 18	23 8.13	-16 34.5	1.050	1.900	21.3	8.9	136.3E
2010 10 19	23 7.98	-16 32.6	1.057	1.899	21.7	8.9	135.3E
2010 10 20	23 7.87	-16 30.5	1.063	1.898	22.0	8.9	134.3E
2010 10 21	23 7.79	-16 28.0	1.070	1.897	22.4	8.9	133.4E
2010 10 22	23 7.74	-16 25.3	1.076	1.896	22.8	9.0	132.4E
2010 10 23	23 7.73	-16 22.3	1.083	1.895	23.2	9.0	131.5E

## 15 Eunomia

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2010 6 25	18 25.87	-29 14.7	1.773	2.785	2.3	9.0	173.6W
2010 6 26	18 24.79	-29 11.9	1.770	2.783	2.2	9.0	174.0W
2010 6 27	18 23.71	-29 8.9	1.768	2.782	2.1	9.0	174.2W
2010 6 28	18 22.62	-29 5.9	1.766	2.780	2.1	9.0	174.1E
2010 6 29	18 21.54	-29 2.8	1.765	2.778	2.2	9.0	173.9E
2010 6 30	18 20.45	-28 59.6	1.764	2.776	2.4	9.0	173.4E
2010 7 1	18 19.37	-28 56.2	1.763	2.774	2.7	9.0	172.7E
2010 7 2	18 18.30	-28 52.9	1.762	2.772	2.9	9.0	172.0E

## 532 Herculina

Date year mo day	R.A.2000 hh mm.mm	Decl.2000 dd pp.p	Delta A.U.	r A.U.	Phase ø	Mag V	Elong. ø
2010 2 23	12 27.25	+22 56.6	1.393	2.292	13.3	9.0	147.8W
2010 2 24	12 26.91	+23 9.0	1.388	2.291	13.0	9.0	148.5W
2010 2 25	12 26.54	+23 21.3	1.384	2.291	12.8	9.0	149.1W
2010 2 26	12 26.14	+23 33.6	1.380	2.290	12.6	9.0	149.7W
2010 2 27	12 25.71	+23 45.8	1.376	2.290	12.4	8.9	150.3W
2010 2 28	12 25.26	+23 57.9	1.373	2.289	12.2	8.9	150.9W
2010 3 1	12 24.79	+24 9.9	1.369	2.289	12.0	8.9	151.4W
2010 3 2	12 24.29	+24 21.8	1.366	2.288	11.8	8.9	151.9W
2010 3 3	12 23.76	+24 33.6	1.363	2.288	11.6	8.9	152.3W
2010 3 4	12 23.21	+24 45.1	1.361	2.287	11.5	8.9	152.7W
2010 3 5	12 22.64	+24 56.6	1.358	2.287	11.3	8.9	153.1W
2010 3 6	12 22.05	+25 7.8	1.356	2.286	11.2	8.9	153.4W
2010 3 7	12 21.44	+25 18.9	1.354	2.286	11.1	8.9	153.6W
2010 3 8	12 20.80	+25 29.8	1.352	2.286	11.0	8.9	153.9W
2010 3 9	12 20.15	+25 40.4	1.351	2.285	11.0	8.9	154.0W
2010 3 10	12 19.49	+25 50.8	1.350	2.285	10.9	8.8	154.2W
2010 3 11	12 18.80	+26 1.0	1.349	2.284	10.9	8.8	154.3W
2010 3 12	12 18.10	+26 10.9	1.348	2.284	10.9	8.8	154.3W
2010 3 13	12 17.39	+26 20.6	1.347	2.284	10.9	8.8	154.3W
2010 3 14	12 16.66	+26 30.0	1.347	2.283	10.9	8.8	154.2W
2010 3 15	12 15.92	+26 39.0	1.347	2.283	11.0	8.8	154.1W
2010 3 16	12 15.17	+26 47.8	1.347	2.283	11.1	8.8	153.9W
2010 3 17	12 14.42	+26 56.3	1.348	2.282	11.1	8.8	153.7W
2010 3 18	12 13.65	+27 4.5	1.348	2.282	11.3	8.9	153.4W
2010 3 19	12 12.88	+27 12.3	1.349	2.282	11.4	8.9	153.1W
2010 3 20	12 12.10	+27 19.8	1.350	2.281	11.5	8.9	152.8W
2010 3 21	12 11.32	+27 26.9	1.351	2.281	11.7	8.9	152.4W
2010 3 22	12 10.54	+27 33.7	1.353	2.281	11.9	8.9	151.9W
2010 3 23	12 9.75	+27 40.2	1.355	2.281	12.0	8.9	151.5W
2010 3 24	12 8.97	+27 46.2	1.357	2.280	12.2	8.9	151.0E
2010 3 25	12 8.19	+27 51.9	1.359	2.280	12.5	8.9	150.5E
2010 3 26	12 7.41	+27 57.3	1.361	2.280	12.7	8.9	149.9E
2010 3 27	12 6.63	+28 2.2	1.364	2.280	12.9	8.9	149.3E
2010 3 28	12 5.86	+28 6.8	1.367	2.280	13.1	8.9	148.7E
2010 3 29	12 5.10	+28 11.0	1.370	2.279	13.4	9.0	148.1E
2010 3 30	12 4.34	+28 14.8	1.373	2.279	13.6	9.0	147.4E
2010 3 31	12 3.60	+28 18.2	1.377	2.279	13.9	9.0	146.7E
2010 4 1	12 2.86	+28 21.2	1.381	2.279	14.2	9.0	146.1E

Date = data nel formato anno/mese/giorno

# CONGIUNZIONI <1° PIANETI - ASTEROIDI m<9

## CONJUNCTIONS <1° PLANETS - ASTEROIDS m<9

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)	tw(h)
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Questo anno non avvengono fenomeni - No phenomena this year

# CONGIUNZIONI MULTIPLE PIANETI - ASTEROIDI

(eventi con 2 o più pianeti ed un asteroide entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS - ASTEROIDS

(events with 2 or more planets and a bright asteroid within 5°)

Date	TT	Dmed	Dmax	emin	m2d	mmax				
2010/07/10	07:43:26	3.929	4.950	-109	5.8	8.8	Jupiter	Uranus	Hebe	

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. del pianeta dalla Terra

R2 = distanza in U.A. dell'asteroide dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del pianeta

m2 = magnitudine dell'asteroide

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di 1° tra loro

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

R1 = distance in A.U. of the planet from the Earth

R2 = distance in A.U. of asteroid from the Earth

P = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the planet

m2 = magnitude of the asteroid

tm = if present, an object is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than 1°

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

# CONGIUNZIONI <1° ASTEROIDI m<9 - OGGETTI MESSIER m<9 CONJUNCTIONS <1° ASTEROIDS m<9 - MESSIER OBJECTS m<9

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)	tw(h)			
2010/01/29 18:31:12		0.03522	0.00102	2.488	153	-83	8.8	6.6		71.6	Pallas	NGC5904	M5
2010/06/02 14:23:16		0.14035	0.00141	1.851	342	-161	7.4	6.0		117.9	Ceres	NGC6523	M8
2010/12/20 11:17:41		0.90026	0.00199	1.246	155	-137	8.1	6.1		1034.4	Iris	NGC2682	M67

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. del pianeta dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del pianeta

m\* = magnitudine dell'oggetto

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di 1° tra loro

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

R1 = distance in A.U. of planet from the Earth

P = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the planet

m\* = magnitude of the object

tm = if present, an object is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than 1°

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**CONGIUNZIONI MULTIPLE PIANETI-ASTEROIDI-STELLE**  
 (eventi con 1 pianeta, una stella di mag<2 ed un asteroide entro 5°)  
**MULTIPLE CONJUNCTIONS PLANETS-ASTEROIDS-STARS**  
 (events with 1 planet, a star with mag<2 and a bright asteroid within 5°)

Data TT Dmed Dmax emin m2d mmax

Questo anno non avvengono fenomeni - No phenomena this year

**CONGIUNZIONI MULTIPLE PIANETI - ASTEROIDI -**  
**OGGETTI MESSIER**  
 (eventi con 1 pianeta, un oggetto mag<2 ed un asteroide entro 5°)  
**MULTIPLE CONJUNCTIONS PLANETS - ASTEROIDS -**  
**MESSIER OBJECTS**  
 (events with 1 planet, an object with mag<2 and a bright asteroid within 5°)

Data TT Dmed Dmax emin m2d mmax

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

# CONGIUNZIONI <1° TRA ASTEROIDI m<9

## CONJUNCTIONS <1° BETWEEN ASTEROIDS m<9

Data	TT	Dm	Dl	r1	r2	p (°)	e	m1	m2	tm(s)	tw(h)
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Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi

R1 = distanza in U.A. del corpo 1 dalla Terra

R2 = distanza in U.A. del corpo 2 dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del primo corpo

m2 = magnitudine del secondo corpo

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di 1° tra loro

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if  $Dm < Dl$  there is an occultation between the bodies

R1 = distance in A.U. of body 1 from the Earth

R2 = distance in A.U. of body 2 from the Earth

P = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the first body

m2 = magnitude of the second body

tm = if present, an object is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than 1°

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# EVENTI <1° LUNA-ASTEROIDI m<9

## EVENTS <1° MOON-ASTEROIDS m<9

### Geocentriche - Geocentric

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)		
2010/05/29	22:02:32	0.09107	1.18272	1.867	0.003	174	-157	7.4	-12.4	3402	Ceres	Moon
2010/06/25	18:42:36	0.97225	1.18244	1.837	0.003	357	172	7.3	-12.5	1934	Ceres	Moon
2010/10/30	08:00:49	0.94039	1.24304	1.650	0.002	198	-92	8.8	-11.0	2221	Iris	Moon
2010/11/27	00:40:29	0.06961	1.24468	1.410	0.002	19	-114	8.4	-11.5	3332	Iris	Moon

### Topocentriche - Topocentric 42°N - 12°E

Date	UT	Dm	Alt.	r1	r2	p	e	m1	m2	tm(s)		
2010/11/26	23:15:35	0.23593	27.59	1.410	0.002	198	-114	8.4	-11.6	3874	Iris	Moon

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. dell'asteroide dalla Terra

R2 = distanza in U.A. della Luna dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine dell'asteroide

m2 = magnitudine della Luna

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

R1 = distance in A.U. of the asteroid from the Earth

R2 = distance in A.U. of the Moon from the Earth

P = angle of position between the bodies, in °

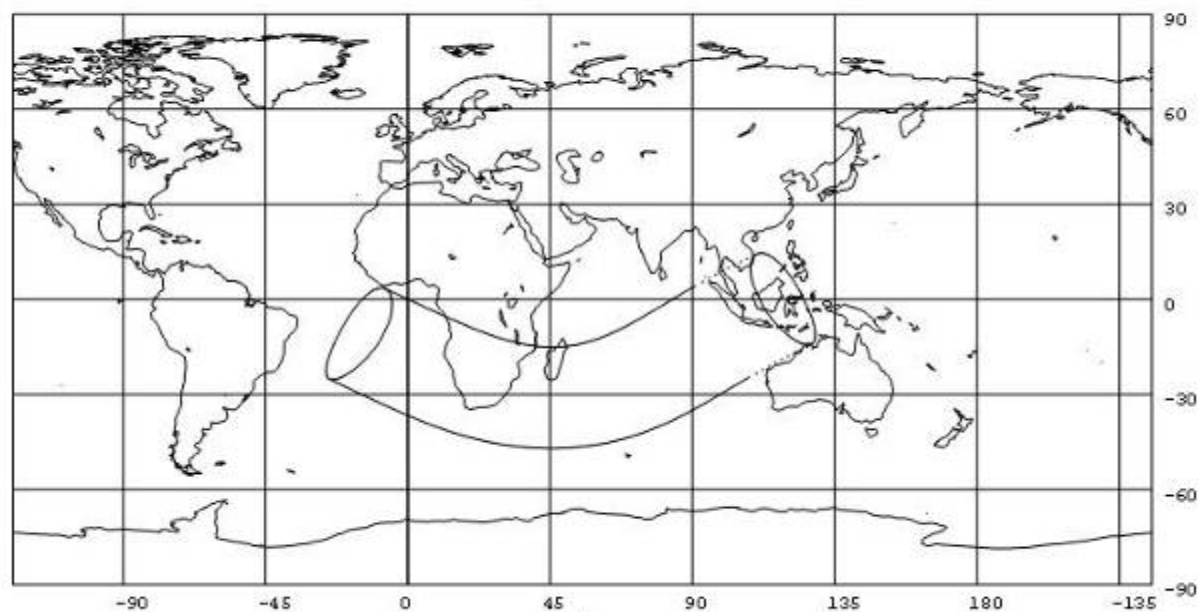
e = elongation, in degree

m1 = magnitude of the asteroid

m2 = magnitude of the Moon

tm = if present, an object is occulted maximum for x seconds

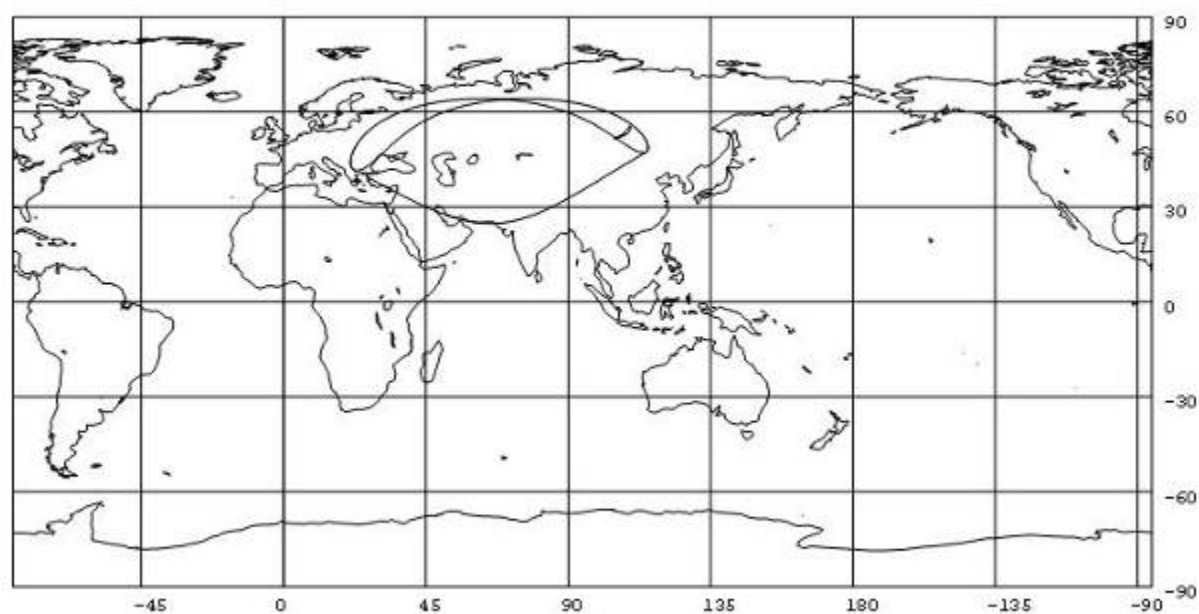
Occultation of Ceres, Magnitude 7.5, on 2010 May 29



Occult4.0.5.0

UT of conjunction = 22h 1.4m

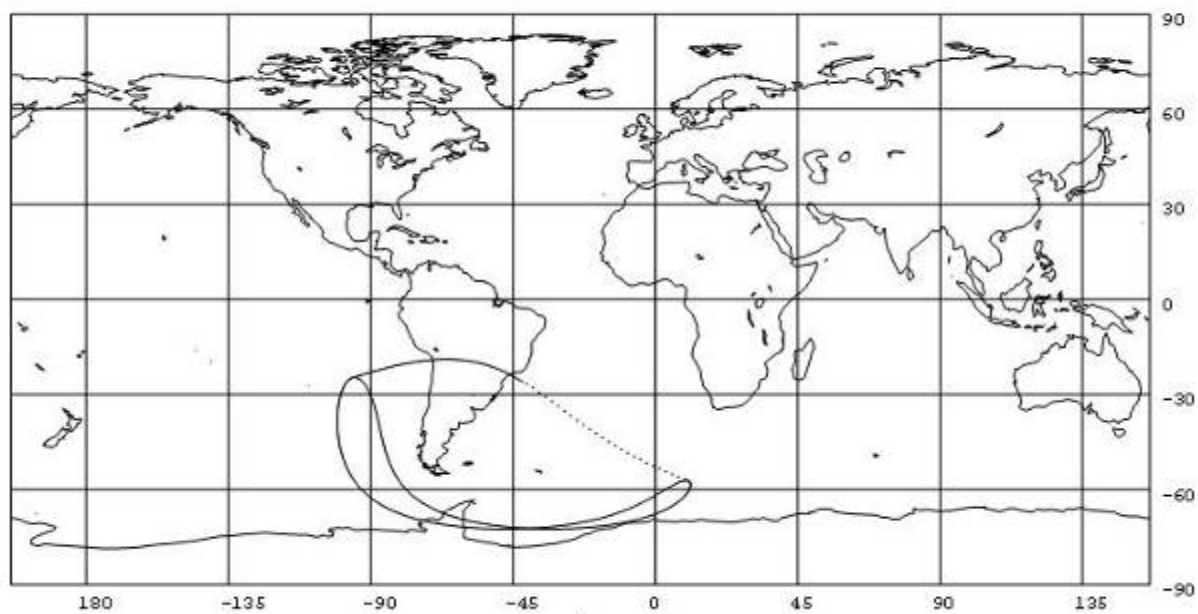
Occultation of Ceres, Magnitude 7.3, on 2010 Jun 25



Occult4.0.5.0

UT of conjunction = 18h 49.2m

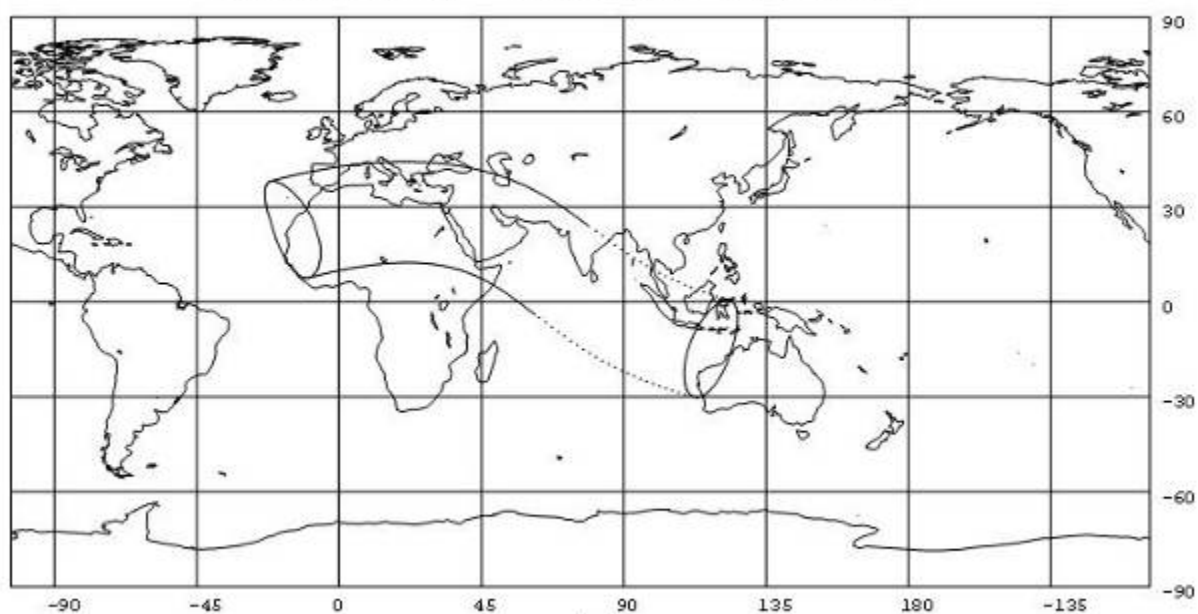
Occultation of Iris, Magnitude 9.4, on 2010 Oct 30



Occult4.0.5.0

UT of conjunction = 8h 33.1m

Occultation of Iris, Magnitude 9.0, on 2010 Nov 27



Occult4.0.5.0

UT of conjunction = 0h 37.9m



# CONGIUNZIONI MULTIPLE PIANETI-LUNA-ASTEROIDI

(eventi con 1 pianeta, la Luna ed un asteroide entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS-MOON-ASTEROIDS

(events with 1 planet, the Moon and an asteroid within 5°)

### Geocentriche - Geocentric

Data            TT            Dmed        Dmax        emin        m2d        mmax

Questo anno non avvengono fenomeni - No phenomena this year

### Topocentriche - Topocentric    42°N - 12°E

Data            UT            Dmed        Dmax        emin        mmax

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

# CONGIUNZ. <0,5° ASTEROIDI m<9-STELLE m<6 CONJUNCTIONS <0,5° ASTEROIDS m<9-STARS m<6

Date	TT	Dm	Dl	RA	Dec	rl	p	e	ml	m*	tm(s)	tw(h)		
2010/01/13	12:29:39	0.23144	0.00096	224.457	0.013	2.654	164	-72	8.8	5.5		63.9	Pallas	
2010/01/29	20:07:40	0.40507	0.00102	229.776	2.086	2.487	153	-83	8.7	5.1		65.5	Pallas	SER
2010/02/13	00:57:49	0.17034	0.00171	187.379	20.832	1.450	88	-140	8.9	5.7		116.5	Herculina	COM
2010/02/16	15:23:36	0.13309	0.00179	155.149	19.532	1.416	211	-171	6.3	4.8		89.9	Vesta	LEO
2010/02/17	04:17:06	0.21366	0.00179	155.020	19.605	1.415	31	-171	6.3	4.0		88.5	Vesta	Gamma2 LEO
2010/02/26	13:43:26	0.44575	0.00115	236.369	7.575	2.215	125	-104	8.5	4.4		73.4	Pallas	Lambda SER
2010/03/07	03:20:59	0.25348	0.00177	150.742	21.666	1.434	23	157	6.3	5.7		105.4	Vesta	
2010/03/20	22:46:29	0.19264	0.00184	182.947	27.383	1.352	214	-152	8.7	6.0		112.7	Herculina	
2010/04/09	01:27:15	0.05901	0.00111	273.709	-21.767	2.344	16	-106	8.0	5.5		195.3	Ceres	SGR
2010/05/22	15:37:19	0.15276	0.00137	273.159	-23.839	1.907	337	-149	7.4	5.0		153.4	Ceres	SGR
2010/06/02	09:14:38	0.14341	0.00141	271.181	-24.497	1.852	342	-161	7.4	6.0		118.3	Ceres	SGR
2010/06/03	08:54:46	0.28796	0.00141	270.972	-24.557	1.848	343	-162	7.3	5.4		112.6	Ceres	SGR
2010/06/08	07:10:33	0.09043	0.00116	227.253	26.176	2.192	338	123	8.6	5.7		183.7	Pallas	BOO
2010/06/23	20:53:20	0.13737	0.00108	225.785	24.911	2.352	293	114	8.8	4.8		198.7	Pallas	Omega BOO
2010/07/13	02:19:57	0.02014	0.00096	171.114	10.451	2.635	26	57	7.7	4.0		56.0	Vesta	Iota LEO
2010/07/16	21:06:33	0.48528	0.00177	2.847	-4.720	1.402	195	-113	8.7	5.9		77.8	Hebe	
2010/07/26	03:16:03	0.29066	0.00092	176.333	7.936	2.745	26	51	7.7	4.9		51.0	Vesta	Xi VIR
2010/08/13	21:12:19	0.19439	0.00233	357.519	-9.843	1.060	111	-146	8.6	6.0		175.4	Flora	
2010/08/16	15:05:48	0.37022	0.00087	185.386	3.586	2.901	206	40	7.8	5.0		46.5	Vesta	VIR
2010/08/26	07:35:43	0.24001	0.00086	189.631	1.577	2.960	25	36	7.8	5.7		47.6	Vesta	
2010/08/31	03:13:25	0.40428	0.00105	261.096	-27.755	2.471	190	104	8.2	5.3		178.0	Ceres	OPH
2010/09/04	23:02:26	0.12677	0.00259	354.639	-13.098	0.955	321	-168	8.3	5.7		96.2	Flora	
2010/09/21	17:30:08	0.46484	0.00261	351.032	-15.390	0.946	332	163	8.2	5.2		91.6	Flora	AQR
2010/09/27	17:25:01	0.45955	0.00253	5.192	-19.721	0.981	127	-158	7.5	5.8		83.8	Hebe	
2010/09/28	16:54:46	0.45912	0.00091	267.035	-28.293	2.876	3	82	8.5	4.6		89.7	Ceres	SGR
2010/10/06	19:20:17	0.32113	0.00087	269.336	-28.387	2.990	2	76	8.6	5.8		86.6	Ceres	
2010/10/08	12:24:16	0.35717	0.00086	269.852	-28.403	3.013	182	75	8.6	6.0		83.8	Ceres	
2010/10/11	06:20:24	0.20265	0.00136	119.142	20.048	1.818	197	-81	9.0	5.4		56.5	Iris	GEM
2010/10/15	22:55:58	0.00843	0.00084	272.197	-28.447	3.115	181	70	8.7	4.6		83.7	Ceres	
2010/10/20	13:06:58	0.04123	0.00233	2.106	-22.484	1.065	336	140	7.8	5.9		293.0	Hebe	
2010/11/05	01:33:42	0.37363	0.00080	223.627	-12.298	3.160	18	5	7.8	5.8		41.7	Vesta	Xi1 LIB
2010/11/24	19:01:37	0.24713	0.00073	286.936	-27.899	3.586	355	43	8.9	3.3		65.1	Ceres	Tau SGR
2010/11/28	15:52:59	0.18333	0.00081	236.129	-15.886	3.130	14	-10	7.8	5.4		43.9	Vesta	Eta LIB
2010/12/03	08:53:17	0.27023	0.00081	238.684	-16.499	3.119	194	-12	7.8	4.1		43.0	Vesta	Theta LIB
2010/12/05	08:54:41	0.35443	0.00071	291.254	-27.492	3.683	173	36	9.0	6.0		60.8	Ceres	
2010/12/06	02:29:43	0.27935	0.00081	240.174	-16.838	3.111	13	-13	7.7	5.5		42.9	Vesta	LIB
2010/12/08	20:27:12	0.37286	0.00070	292.696	-27.332	3.712	353	34	9.0	5.5		59.8	Ceres	
2010/12/18	11:17:41	0.28134	0.00083	246.975	-18.205	3.068	191	-19	7.7	4.3		43.1	Vesta	Chi OPH
2010/12/24	06:59:45	0.20471	0.00068	299.170	-26.471	3.821	350	24	9.0	4.7		61.3	Ceres	Omega SGR
2010/12/24	22:59:52	0.34323	0.00203	131.801	12.400	1.223	166	-142	8.0	5.9		153.5	Iris	CNC
2010/12/26	03:04:54	0.19044	0.00068	299.946	-26.352	3.832	350	23	9.0	4.9		61.3	Ceres	SGR
2010/12/26	19:04:34	0.36180	0.00148	12.281	-13.207	1.670	144	91	9.0	5.6		55.7	Hebe	
2010/12/29	17:50:20	0.38673	0.00206	131.009	12.256	1.203	352	-147	8.0	5.7		121.4	Iris	CNC

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

A.R. e Dec = coordinate apparenti della stella

Rl = distanza in U.A. dell'asteroide dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

ml = magnitudine dell'asteroide

m\* = magnitudine della stella

tm = se presente, la stella viene occultata massimo per x secondi

tw = semiperiodo in ore in cui i due corpi distano meno di 0.5° tra loro

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

A.R. e Dec = apparent coordinates of the star

Rl = distance in A.U. of the asteroid from the Earth

P = angle of position between the bodies, in °

e = elongation, in degree

ml = magnitude of the asteroid

m\* = magnitude of the star

tm = if present, the star is occulted maximum for x seconds

tw = semiperiod in hours in which the two bodies are near less than 0.5°

# OCCULTAZIONI ASTEROIDALI GEOCENTRICHE DI STELLE

m<6

# GEOCENTRIC ASTEROIDAL OCCULTATIONS OF STARS m<6

Date	U.T.	Diameter	Durn	Star	Mag-Drop	Elon	%	Star	Planet	Min	R.A. (J2000)	Dec.
y m d	h m	km "	sec/m	mag	V R	o	Ill	No.	No Name	D Error	h m s	o ' "
2010 Jan 2	2 47.3	18 0.008	1.4s	5.2	13.2 12.9	94		HIP 62267	11221 1999 JO26	0.94 0.07	12 45 36.986	7 40 24.01
2010 Jan 4	23 19.9	48 0.016	1.1s	4.1	12.0 11.6	29		HIP 104139	316 Goberta	1.00 0.09	21 5 56.883	-17 13 58.92
2010 Jan 18	16 38.6	55 0.023	1.3s	5.0	9.1 9.1	39		TYC 6820-00326-1p	371 Bohemia	0.94 0.08	17 15 21.090	-26 35 56.01
2010 Feb 2	8 43.8	79 0.003	2.3s	5.3	19.1 19.5	3		HIP 104974	2000 PU29	0.59 0.97	21 15 44.860	-15 10 17.35
2010 Feb 2	16 59.0	44 0.020	1.0s	5.9	10.2 10.5	35		HIP 113622	623 Chimaera	0.10 0.07	23 0 42.903	3 0 41.64
2010 Feb 7	16 0.5	22 0.017	3.0s	3.5	13.0 12.8	150		HIP 35550	6337 Shiota	0.79 0.04	7 20 7.369	21 58 56.24
2010 Mar 2	23 46.3	25 0.015	2.0s	3.0	12.6 12.6	156		HIP 47908	3062 Wren	1.09 0.05	9 45 51.040	23 46 27.23
2010 Mar 3	19 34.0	58 0.030	3.1s	3.8	9.8 9.9	85		HIP 20885	67 Asia	1.25 0.06	4 28 34.570	15 57 43.70
2010 Mar 20	24 2.1	65 0.040	4.8s	5.6	9.0 8.6	168		HIP 61968	1356 Nyanza	0.88 0.05	12 41 57.068	6 48 23.71
2010 Mar 23	13 34.6	53 0.031	4.2s	5.6	9.9 9.9	101		HIP 34267	2617 Jiangxi	0.44 0.05	7 6 11.547	34 28 25.79
2010 Mar 23	17 59.4	34 0.018	8.3s	5.8	9.3 9.4	120		HIP 40866	226 Weringia	0.78 0.06	8 20 21.021	20 44 51.33
2010 Apr 6	10 44.6	34 0.026	8.6s	2.5	12.2 11.8	126		HIP 81377	824 Anastasia	0.51 0.04	16 37 9.550	-10 34 1.28
2010 Apr 11	2 54.6	32 0.016	1.7s	6.0	9.9 9.5	85		HIP 34002	995 Sternberga	0.32 0.06	7 3 17.899	9 8 18.11
2010 Apr 21	18 44.0	17 0.015	2.9s	5.7	9.5 9.5	135		HIP 53316	6662 1993 BP13	1.01 0.04	10 54 17.773	-13 45 28.86
2010 Apr 25	13 46.1	19 0.014	2.7s	5.9	11.7 11.4	149		HIP 60030	11204 1999 FQ28	1.16 0.04	12 18 40.341	- 0 47 14.04
2010 Apr 30	7 10.5	32 0.019	2.2s	3.3	10.4 10.5	167		HIP 68895	984 Gretia	1.12 0.05	14 6 22.331	-26 40 57.96
2010 May 11	18 12.4	37 0.034	2.7s	5.0	9.3 8.8	155		HIP 69389	7476 Ogiltsbie	0.01 0.03	14 12 15.776	2 24 33.68
2010 May 15	13 2.0	20 0.012	2.2s	5.8	11.8 11.4	145		HIP 85889	17445 Avatcha	0.11 0.05	17 33 7.394	-41 10 23.07
2010 May 27	21 37.5	70 0.050	5.9s	5.7	8.1 8.2	161		HIP 73184	906 Repsolda	1.23 0.04	14 57 28.774	-21 25 13.66
2010 May 30	18 45.2	37 0.032	3.8s	5.8	8.8 8.9	165		HIP 75944	1039 Sonneberga	0.98 0.04	15 30 40.420	-16 36 34.11
2010 Jun 11	7 14.7	58 0.037	2.9s	4.5	9.7 10.1	89		HIP 114144	547 Praxedis	0.27 0.05	23 7 0.264	9 24 34.04
2010 Jun 25	8 12.0	73 0.057	7.1s	5.5	7.9 8.2	164		HIP 95503	177 Irma	0.45 0.04	19 25 29.645	-23 57 44.97
2010 Jun 28	15 44.7	37 0.027	3.0s	5.5	8.9 9.0	166		HIP 95865	1284 Latvia	1.22 0.04	19 29 52.202	-26 59 8.66
2010 Jul 7	23 5.4	59 0.036	4.7s	3.9	10.9 10.8	154		HIP 97804	904 Rockefelleria	0.15 0.05	19 52 28.373	1 0 20.28
2010 Jul 8	21 58.0	51 0.036	5.6s	2.7	10.8 11.2	133		HIP 79593	472 Roma	0.37 0.05	16 14 20.705	- 3 41 41.06
2010 Jul 22	4 47.2	130 0.077	98.8s	6.0	7.3 7.4	121		HIP 671	187 Lamberta	0.44 0.05	0 8 17.507	- 8 49 27.18
2010 Jul 28	5 15.1	40 0.025	5.1s	3.9	11.5 11.6	110		HIP 76333	1200 Imperatrix	0.53 0.05	15 35 31.626	-14 47 22.25
2010 Aug 3	20 11.4	15 0.005	1.7s	3.0	16.1 15.9	134		HIP 87073	17442 1989 UO5	0.53 0.10	17 47 35.081	-40 7 37.26
2010 Aug 7	3 58.4	17 0.018	2.1s	5.8	9.1 8.6	154		HIP 113031	4860 Gubbio	1.04 0.03	22 53 28.718	-11 36 59.44
2010 Aug 8	9 15.3	55 0.023	4.8s	3.3	13.1 13.3	149		HIP 93864	2312 Duboshin	0.41 0.07	19 6 56.369	-27 40 16.17
2010 Aug 15	5 22.4	50 0.019	1.1s	5.6	9.9 10.2	24		HIP 39177	743 Eugenisis	0.63 0.08	8 0 47.298	17 18 31.30
2010 Aug 17	17 19.8	25 0.011	1.0s	5.9	11.1 10.6	74		HIP 21604	561 Ingwelde	0.96 0.07	4 38 15.820	20 41 4.92
2010 Aug 20	18 13.6	86 0.042	2.0s	6.0	8.4 8.0	43		HIP 34182	449 Hamburga	0.21 0.06	7 5 18.368	22 38 14.74
2010 Aug 29	15 41.6	25 0.010	1.5s	5.5	13.1 12.9	89		HIP 19335	22097 2000 BH4	0.23 0.08	4 8 36.765	38 2 20.89
2010 Sep 6	13 45.2	30 0.022	3.0s	5.2	11.1 11.0	156		HIP 2762	4813 Terebizh	0.18 0.04	0 35 15.171	- 3 35 34.61
2010 Sep 30	20 15.7	98 0.045	3.0s	3.1	9.9 10.0	54		HIP 43813	148 Gallia	0.07 0.07	8 55 23.554	5 56 44.20
2010 Oct 4	14 51.3	27 0.013	1.0s	5.9	10.1 9.7	70		HIP 40881	862 Franzia	0.22 0.06	8 20 32.120	24 1 20.12
2010 Oct 17	16 21.7	22 0.007	1.5s	5.8	12.6 12.2	123		HIP 23916	24587 Kapaneus	0.16 0.10	5 8 20.193	- 8 39 55.39
2010 Oct 18	2 13.7	50 0.032	1.6s	3.1	11.7 12.1	70		HIP 89642	564 Dudu	1.20 0.05	18 17 37.519	-36 45 43.86
2010 Nov 8	14 52.0	31 0.018	2.4s	4.0	12.3 11.9	156		HIP 18614	5374 Hokutosei	0.79 0.06	3 58 57.906	35 47 27.73
2010 Nov 19	6 39.3	19 0.013	1.6s	2.9	14.8 14.2	159		HIP 18532	25559 1999 XW172	0.56 0.05	3 57 51.245	40 0 36.52
2010 Nov 25	8 41.2	16 0.006	1.0s	3.6	14.2 13.8	175		HIP 17847	11668 Balios	0.21 0.08	3 49 9.757	24 3 11.82
2010 Nov 26	3 34.9	30 0.022	1.3s	6.0	10.4 10.1	80		HIP 107302	1736 Floirac	0.33 0.04	21 44 0.948	-14 44 57.62
2010 Nov 29	5 44.8	27 0.020	2.6s	4.9	10.2 9.6	164		HIP 25539	1674 Groeneveld	0.37 0.04	5 27 38.084	21 56 13.00
2010 Dec 3	9 9.8	21 0.016	2.2s	5.6	10.5 10.6	156		HIP 14439	3623 Chaplin	1.02 0.04	3 6 23.687	13 11 13.41
2010 Dec 7	22 42.4	131 0.070	5.4s	5.4	7.9 7.4	75		HIP 109472	356 Liguria	0.09 0.06	22 10 37.504	-11 33 53.68
2010 Dec 15	2 56.7	40 0.017	1.5s	5.9	10.5 10.6	72		HIP 110532	2025 Nortia	0.71 0.07	22 23 32.146	- 7 11 39.83

Date : anno/mese/giorno  
Ora : in Tempo Universale  
Diameter : dimensione dell'asteroide in km ed in "  
Durn : durata dell'evento in secondi o minuti  
Star mag : magnitudine della stella  
Mag drop : caduta di luce  
Elon : elongazione, in gradi  
% ill : valore nullo  
Star : stella  
D : distanza dell'evento dal centro della Terra  
Error = incertezza di calcolo in raggio terrestri

Date = date in the format year/month/day  
U.T. = times  
Diameter = diameter in km and in " of the asteroid  
Durn = duration of the event, in minutes or seconds  
Star Mag = star magnitude - visual  
Mag V = magnitude drop at occultation - based on visual magnitude  
Drop R = magnitude drop at occultation - based on the star's red magnitude, and an asteroid color (B-V) of 0.83. This may be a better guide for CCD observers  
Elon = elongation, in degree  
% ill = null  
Min D = the minimum distance of the center of the occultation path from the center of the Earth  
Error = the uncertainty in the location of the path, in Earth radii

# OCCULTAZIONI ASTEROIDALI TOPOCENTRICHE DI STELLE $m < 6$ TOPOCENTRIC ASTEROIDAL OCCULTATIONS OF STARS $m < 6$ 42°N - 12°E

Date	U.T.	Diameter	Durn	Star	Mag-Drop	Elon	%	Star	Planet	Alt	Dist	Sun	Proba-	Moon	R.A. (J2000)	Dec.
y m d	h m	km "	sec/m	mag	V R	o Ill		No.	No Name	o km Alt	bility	ill	Elon	h m s	o ' "	
2010 Jan 2	2 47.2	18 0.008	1.4s	5.2	13.2 12.9	94	HIP	62267	11221 1999 JO26	43 6302	0%	97 68	12 45 36.986	7 40 24.01		
2010 Feb 2	16 59.1	44 0.020	1.0s	5.9	10.2 10.5	35	HIP	113622	623 Chimaera	28 2802	-6 0%	83 165	23 0 42.903	3 0 41.64		
2010 Feb 7	16 0.9	22 0.017	3.0s	3.5	13.0 12.8	150	HIP	35550	6337 Shiota	21 5085	7 0%	33 140	7 20 7.369	21 58 56.24		
2010 Mar 2	23 45.9	25 0.015	2.0s	3.0	12.6 12.6	156	HIP	47908	3062 Wren	64 9810	2%	92 55	9 45 51.040	23 46 27.23		
2010 Mar 3	19 34.2	58 0.030	3.1s	3.8	9.8 9.9	85	HIP	20885	67 Asia	47 13199	2%	86 137	4 28 34.570	15 57 43.70		
2010 Mar 20	24 1.9	65 0.040	4.8s	5.6	9.0 8.6	168	HIP	61968	1356 Nyanza	55 4581	0%	25 126	12 41 57.068	6 48 23.71		
2010 Mar 23	17 57.8	34 0.018	8.3s	5.8	9.3 9.4	120	HIP	40866	226 Weringia	61 10136	-5 0%	53 26	8 20 21.021	20 44 51.33		
2010 Apr 21	18 43.4	17 0.015	2.9s	5.7	9.5 9.5	135	HIP	53316	6662 1993 BP13	31 12349	-6 1%	50 51	10 54 17.773	-13 45 28.86		
2010 May 27	21 37.4	70 0.050	5.9s	5.7	8.1 8.2	161	HIP	73184	906 Repsolda	27 4996	14% 100	18	14 57 28.774	-21 25 13.66		
2010 Jul 7	23 5.4	59 0.036	4.7s	3.9	10.9 10.8	154	HIP	97804	904 Rockefelleria	47 3278	0%	18 111	19 52 28.373	1 0 20.28		
2010 Jul 8	21 58.1	51 0.036	5.6s	2.7	10.8 11.2	133	HIP	79593	472 Roma	39 827	0%	11 159	16 14 20.705	-3 41 41.06		
2010 Aug 3	20 11.2	15 0.005	1.7s	3.0	16.1 15.9	134	HIP	87073	17442 1989 UO5	8 10675	0%	44 140	17 47 35.081	-40 7 37.26		
2010 Aug 7	3 57.8	17 0.018	2.1s	5.8	9.1 8.6	154	HIP	113031	4860 Gubbio	23 2725	-2 4%	12 113	22 53 28.718	-11 36 59.44		
2010 Nov 19	6 39.1	19 0.013	1.6s	2.9	14.8 14.2	159	HIP	18532	25559 1999 XW172	13 1435	6 0%	94 39	3 57 51.245	40 0 36.52		
2010 Nov 29	5 44.3	27 0.020	2.6s	4.9	10.2 9.6	164	HIP	25539	1674 Groeneveld	19 6664	-5 0%	46 79	5 27 38.084	21 56 13.00		

Date : anno/mese/giorno  
 Ora : in Tempo Universale  
 Diameter : dimensione dell'asteroide in km ed in "  
 Durn : durata dell'evento in secondi o minuti  
 Star mag : magnitudine della stella  
 Mag drop : caduta di luce  
 Elon : elongazione, in gradi  
 % ill : valore nullo  
 Star : stella  
 Alt : altezza sull'orizzonte, in gradi  
 Sun alt : altezza del Sole sull'orizzonte in °  
 Probability : probabilità che l'evento accada  
 Moon ill : percentuale di Luna illuminata  
 Moon elon : elongazione lunare in °

Date = date in the format year/month/day  
 U.T. = times  
 Diameter = diameter in km and in " of the asteroid  
 Durn = duration of the event, in minutes or seconds  
 Star Mag = star magnitude - visual  
 Mag V = magnitude drop at occultation - based on visual magnitude  
 Drop R = magnitude drop at occultation - based on the star's red magnitude, and an asteroid color (B-V) of 0.83. This may be a better guide for CCD observers  
 Elon = elongation, in degree  
 % ill = null

## CONGIUNZIONI MULTIPLE LUNA-ASTEROIDI-STELLE

(eventi con la Luna, 1 asteroide di mag<9 ed 1 stella di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS MOON-ASTEROIDS-STARS

(events with the Moon, 1 asteroid with mag<9 and 1 star with mag<2 within 5°)

Geocentriche - Geocentric

Data	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Topocentriche - Topocentric 42°N - 12°E

Data	UT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

## CONGIUNZIONI MULTIPLE LUNA-ASTEROIDI-OGGETTI

(eventi con la Luna, 1 asteroide di mag<9 ed 1 oggetto di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS MOON-ASTEROIDS-OBJECTS

(events with the Moon, 1 asteroid with mag<9 and 1 object with mag<2 within 5°)

Geocentriche - Geocentric

Data	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Topocentriche - Topocentric 42°N - 12°E

Data	UT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# CONGIUNZIONI MULTIPLE LUNA-ASTEROIDI-OGGETTI

(eventi con la Luna, 1 asteroide di mag<9 ed 1 oggetto di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS MOON-ASTEROIDS-OBJECTS

(events with the Moon, 1 asteroid with mag<9 and 1 object with mag<2 within 5°)

Geocentriche - Geocentric

Data	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Topocentriche - Topocentric 42°N - 12°E

Data	UT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# **ASTEROIDI MOLTO VICINI $\Delta < 0.01$ U.A.** **NEAR ASTEROIDS $\Delta < 0.01$ A.U.**

Object	Date of approach (TDB) AAAA-mmm-DD HH:MM $\pm$ D_HH:MM	Nominal distance A.U.	Minima distance A.U.	V relative (km/s)	H
2005 YU55	2010-Apr-19 10:33 $\pm$ 06:29	0.0135	0.0016	13.17	22.0
2007 DS7	2010-Aug-26 03:45 $\pm$ 3 02:06	0.0956	0.0080	9.81	25.8

Legenda :

Date of approach = data calcolata (anno-mese-giorno-ora-minuti  $\pm$  incertezza in giorni-ore-minuti) di avvicinamento alla Terra

Nominal/minima distance = nominale è quella calcolata, minima è quella calcolata tenendo conto dell'incertezza  $\pm 3\sigma$

V relative = velocità relativa tra Terra ed asteroide

H = magnitudine assoluta dell'asteroide

## **AVVICINAMENTI ASTEROIDI-PIANETI $\Delta < 10^6$ KM** **APPROACHES ASTEROIDS-PLANETS $\Delta < 10^6$ KM**

Data TDT Dm (Gm) V (km/s) Err (Gm) r1 (AU) r2

Questo anno non avvengono fenomeni - No phenomena this year

## **AVVICINAMENTI TRA ASTEROIDI** **APPROACHES BETWEEN ASTEROIDS**

Date	TT	Dist	V (km/s)	Err	r1	r2		
2010/03/13	09:54:43	2193	3.1378	360	2.4259	2.4259	1993FF24	2000SV140
2010/04/09	16:21:19	5980	6.2474	3126	2.9781	2.9780	2004BW115	2006DX27
2010/05/12	21:04:07	8568	6.7927	284	2.1810	2.1810	Poleungku	2005OF29
2010/06/10	07:55:57	4301	3.5468	606	2.4097	2.4097	2001HP54	2000SD59
2010/09/17	19:07:22	5163	4.5201	279	2.4831	2.4831	1992OB3	2002XU43
2010/10/31	06:37:49	4142	5.3745	240	2.3316	2.3316	2000MH3	2002XE71
2010/11/26	18:31:27	6756	6.9058	810	2.7303	2.7303	2003BK25	2000QH51

Data nel formato anno/mese/giorno

Dist = distanza minima in km tra i centri dei corpi

V = velocità relativa tra i corpi

Err = incertezza del calcolo in km

R1 = distanza in U.A. del corpo 1 dalla Terra

R2 = distanza in U.A. del corpo 2 dalla Terra

Ultime 2 colonne : nomi dei corpi

Date in the format year/month/day

Dist = least distance in km

V = relative velocity

Err = uncertainty of the calculation in km

R1 = distance in A.U. of body 1 from the Earth

R2 = distance in A.U. of body 2 from the Earth

Last 2 columns : names

## TRANSITI DI ASTEROIDI SUI PIANETI PLANETARY TRANSITS OF ASTEROIDS

Data	TT	Dm	r1	r2	p	e	m1	m2	tm(s)
------	----	----	----	----	---	---	----	----	-------

Questo anno non avvengono fenomeni - No phenomena this year

NB: SONO STATI PRESI IN CONSIDERAZIONE SOLO GLI ASTEROIDI CHE POTREBBERO SUPERARE 1" DI DIAMETRO ALL'OPPOSIZIONE (VEDI TABELLA SUCCESSIVA)

NB: I HAVE CONSIDERED ONLY THE ASTEROIDS THAT COULD OVERCOME 1" OF DIAMETER TO THE OPPOSITION. TO SEE THE FOLLOWING CHART.

## TRANSITI DI ASTEROIDI SUL SOLE SOLAR TRANSITS OF ASTEROIDS

Data	TT	Dm	r1	r2	p	e	m1	m2	tm(s)
------	----	----	----	----	---	---	----	----	-------

Questo anno non avvengono fenomeni - No phenomena this year

NB: SONO STATI PRESI IN CONSIDERAZIONE SOLO GLI ASTEROIDI CHE POTREBBERO SUPERARE 1" DI DIAMETRO ALL'OPPOSIZIONE (VEDI TABELLA SUCCESSIVA)

NB: I HAVE CONSIDERED ONLY THE ASTEROIDS THAT COULD OVERCOME 1" OF DIAMETER TO THE OPPOSITION. TO SEE THE FOLLOWING CHART.



# OCCULTAZIONI TRA ASTEROIDI

## OCCULTAZIONS BETWEEN ASTEROIDS

Date	TT	Dm	Dl	Err	r1	r2	p	e	m1	m2	tm(s)		
2010/02/01	03:42:35	0.00036	0.00042	0.00003	3.136	2.041	208	73	14.9	17.7	1.4	Caecilia	1999YQ
2010/03/13	03:11:33	0.00035	0.00252	0.00012	3.799	0.775	325	-42	14.0	17.4	1.5	Liguria	2003SD220
2010/04/05	15:06:57	0.00016	0.00068	0.00005	3.840	1.866	334	-13	13.9	20.9	1.3	Veritas	1990OS
2010/04/10	19:04:38	0.00017	0.00074	0.00009	3.445	1.694	167	29	14.0	21.0	1.5	Erato	Apophis
2010/04/15	22:45:54	0.00064	0.00085	0.00010	4.148	1.708	168	29	14.4	21.0	1.0	Adorea	Apophis
2010/04/21	05:26:09	0.00032	0.00045	0.00004	3.842	2.269	348	-78	13.5	16.2	6.1	Palma	Dezhnev
2010/05/08	12:35:56	0.00005	0.00026	0.00003	4.249	2.952	350	15	14.4	17.7	5.1	Adorea	Mats
2010/05/12	09:53:49	0.00002	0.00036	0.00003	2.697	1.937	117	-92	14.9	15.9	3.3	Claudia	Erbisbuhl
2010/06/07	11:44:01	0.00006	0.00092	0.00004	4.336	1.654	319	-41	13.0	20.0	2.6	Cybele	2001WR1
2010/07/11	13:41:45	0.00125	0.00564	0.00010	1.842	0.351	26	111	11.8	17.7	1.1	Sappho	2001SX169
2010/08/08	14:36:38	0.00055	0.00101	0.00004	4.060	1.523	35	32	13.3	19.9	1.1	Kleopatra	2000PJ6
2010/08/28	19:49:38	0.00356	0.00664	0.00055	2.435	0.320	346	63	14.8	18.0	1.0	Newtonia	2001WN5
2010/09/17	19:23:43	0.00033	0.00088	0.00002	2.962	1.433	179	80	13.8	17.5	2.1	Budrosa	2000JO23
2010/10/11	08:47:01	0.00155	0.00254	0.00004	3.017	0.731	168	-72	13.5	21.3	3.9	Pulcova	2000EE104
2010/11/11	07:47:46	0.00670	0.00754	0.00011	1.765	0.275	236	-146	9.7	17.8	1.5	Psyche	2000GJ147

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi

Err = incertezza del calcolo

R1 = distanza in U.A. del corpo 1 dalla Terra

R2 = distanza in U.A. del corpo 2 dalla Terra

P = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del primo corpo

m2 = magnitudine del secondo corpo

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

**NB: SONO STATI PRESI IN CONSIDERAZIONE SOLO GLI EVENTI DI DURATA MAGGIORE DI 1 SECONDO ED IN CUI IL CORPO OCCULTATO HA MAG<15**

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if  $Dm < Dl$  there is an occultation between the bodies

Err = uncertainty of the calculation in °

R1 = distance in A.U. of body 1 from the Earth

R2 = distance in A.U. of body 2 from the Earth

P = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the first body

m2 = magnitude of the second body

tm = if present, the asteroid is occulted maximum for x seconds

**NB: I HAVE CONSIDERED ONLY THE EVENTS OF DURATION GREATER THAN 1 SECOND AND IN WHICH THE HIDDEN HAS MAG<15**

# ELENCO ASTEROIDI CON m MIN. TEORICA <9

## ASTEROIDS WITH THEORETICAL LEAST mag. <9

Asteroidi	mag. min.	H						
(1) Ceres	6.4	3.3	(85182) 1991 AQ	8.4	17.1	2001 BF10	7.3	22.6
(2) Pallas	6.3	4.1	(85236) 1993 KH	4.3	18.9	2001 EC	5.6	18.6
(3) Juno	7.0	5.3	(85640) 1998 OX4	6.6	21.2	2001 FO32	6.4	17.7
(4) Vesta	5.1	3.2	(85713) 1998 SS49	3.2	15.7	2001 HA4	8.7	17.6
(5) Astraea	8.6	6.8	(86039) 1999 NC43	8.0	16.0	2001 TX44	8.9	19.2
(6) Hebe	7.1	5.7	(86819) 2000 GK137	8.5	17.4	2001 VK5	0.1	17.8
(7) Iris	6.5	5.5	(88254) 2001 FM129	7.3	17.3	2001 WS1	6.0	17.0
(8) Flora	7.6	6.5	(89830) 2002 CE	6.9	14.7	2001 WV1	8.9	22.5
(9) Metis	8.1	6.3	(89958) 2002 LY45	3.1	16.9	2001 XU	4.0	19.2
(10) Hygiea	8.9	5.4	(89959) 2002 NT7	1.2	16.5	2001 XP1	8.7	17.9
(11) Parthenope	8.6	6.6	(90075) 2002 VU94	8.0	15.7	2001 YN2	8.8	25.4
(12) Victoria	8.1	7.2	(90416) 2003 YK118	3.6	18.7	2001 YB5	8.9	20.9
(14) Irene	8.3	6.3	(99942) Apophis	0.4	19.2	2002 AJ129	7.6	18.5
(15) Eunomia	7.4	5.3	(100085) 1992 UY4	8.6	17.8	2002 CY9	8.2	19.5
(16) Psyche	8.8	5.9	(101869) 1999 MM	5.7	19.3	2002 EY2	3.0	19.0
(18) Melpomene	7.3	6.5	(101955) 1999 RQ36	8.3	20.9	2002 EM7	-0.9	24.4
(19) Fortuna	8.8	7.1	(111253) 2001 XU10	7.7	15.3	2002 GM2	8.6	18.5
(20) Massalia	8.3	6.5	(136617) 1994 CC	8.9	17.8	2002 JZ8	7.4	21.1
(21) Lutetia	9.0	7.3	(136618) 1994 CN2	7.4	16.9	2002 JB9	8.5	15.9
(23) Thalia	8.6	6.9	(137108) 1999 AN10	1.4	17.9	2002 LV	6.5	16.5
(27) Euterpe	8.4	7.0	(137427) 1999 TF211	7.3	15.0	2002 MN	7.9	23.6
(29) Amphitrite	8.4	5.8	(138127) 2000 EE14	9.0	17.1	2002 NY40	3.9	19.0
(39) Laetitia	8.9	6.1	(139622) 2001 QQ142	8.7	18.4	2002 SZ	6.5	20.4
(40) Harmonia	9.0	7.0	(140288) 2001 SN289	7.5	16.4	2002 SQ41	6.7	20.1
(41) Daphne	8.8	7.1	(141495) 2002 EZ11	3.6	18.2	2002 TR190	7.5	19.0
(42) Isis	8.7	7.5	(143404) 2003 BD44	8.0	16.7	2003 DZ15	4.2	22.2
(43) Ariadne	8.8	7.9	(143487) 2003 CR20	2.6	18.8	2003 EP4	8.6	23.9
(44) Nysa	8.8	7.0	(143649) 2003 QQ47	4.5	17.4	2003 HF2	7.2	19.6
(80) Sappho	8.9	8.0	(143651) 2003 QO104	4.1	16.0	2003 KO2	6.0	20.2
(89) Julia	8.4	6.6	(143992) 2004 AF	8.8	16.1	2003 LN6	8.6	24.7
(115) Thyra	8.9	7.5	(144332) 2004 DV24	5.6	16.6	2003 MH4	6.9	20.0
(192) Nausikaa	8.0	7.1	(144898) 2004 VD17	4.9	18.9	2003 MK4	7.1	20.9
(324) Bamberg	7.6	6.8	(152664) 1998 FW4	8.9	19.6	2003 QC10	3.2	18.0
(344) Desiderata	9.0	8.1	(152680) 1998 KJ9	7.9	19.4	2003 RN10	5.8	15.9
(433) Eros	7.3	11.2	(153201) 2000 WO107	6.9	19.3	2003 UV11	8.5	19.3
(471) Papagena	9.0	6.7	(153220) 2000 YN29	8.4	17.5	2003 WP7	7.5	24.2
(532) Herculina	8.3	5.8	(153249) 2001 BW15	8.9	15.0	2003 YG118	7.6	17.1
(887) Alinda	8.8	13.8	(153814) 2001 WN5	4.6	18.3	2003 YH136	8.9	19.4
(1036) Ganymed	7.8	9.4	(154276) 2002 SY50	4.6	17.6	2004 BE68	8.6	18.5
(1620) Geographos	8.1	15.6	(159857) 2004 LJ1	7.1	15.5	2004 BL86	8.5	18.9
(1627) Ivar	8.7	13.2	(161989) Cacus	8.1	17.1	2004 DC	7.8	18.1
(1685) Toro	7.9	14.2	(162162) 1999 DB7	6.4	19.9	2004 FH	1.9	25.7
(1862) Apollo	8.4	16.3	(162173) 1999 JU3	3.0	19.2	2004 FU4	5.6	18.5
(1866) Sisyphus	8.3	13.0	(162416) 2000 EH26	6.6	21.7	2004 FU162	8.8	28.7
(1917) Cuyo	8.5	13.9	(162474) 2000 LB16	6.7	18.5	2004 HE	1.3	26.8
(1981) Midas	3.2	15.5	(162825) 2001 BO61	8.5	17.9	2004 HW	6.9	17.2
(2135) Aristaeus	7.9	17.9	(163132) 2002 CU11	2.9	18.3	2004 HZ	5.6	22.6
(2201) Oljato	1.2	15.3	(163243) 2002 FB3	4.2	16.3	2004 HE12	7.2	17.5
(2340) Hathor	8.4	19.2	(163373) 2002 PZ39	6.4	19.0	2004 LV3	8.9	18.7
(3122) Florence	7.5	14.2	(163899) 2003 SD220	8.2	16.8	2004 MX2	6.5	19.3
(3200) Phaethon	6.2	14.6	(164121) 2003 YT1	3.8	16.2	2004 QY2	8.2	14.7
(3362) Khufu	9.0	18.3	(164207) 2004 GU9	6.4	21.2	2004 QT24	7.5	18.3
(3671) Dionysus	7.8	16.3	(164216) 2004 OT11	8.0	17.3	2004 RQ252	4.6	22.5
(4179) Toutatis	4.2	15.3	(170086) 2002 XR14	8.3	18.1	2004 ST26	7.4	26.3
(4183) Cuno	7.0	14.4	(171576) 1999 VP11	5.0	18.7	2004 TN1	7.3	21.8
(4581) Asclepius	8.0	20.4	(172678) 2003 YM137	6.8	18.7	2004 TL10	9.0	21.4
(4660) Nereus	5.8	18.2	(177049) 2003 EE16	0.2	19.8	2004 UE	5.5	21.2
(4769) Castalia	8.5	16.9	(177614) 2004 HK33	7.6	17.6	2004 VC17	5.7	18.4
(4953) 1990 MU	6.4	14.1	(186844) 2004 GA1	8.4	17.5	2004 XN14	7.6	20.0
(5143) Heracles	8.1	14.0	1990 HA	7.3	16.3	2004 XP14	5.7	19.4
(5693) 1993 EA	5.7	17.0	1990 SM	8.3	16.1	2004 XM29	8.3	22.9
(7335) 1989 JA	8.7	17.0	1994 AW1	9.0	17.5	2004 XL35	8.6	19.4
(7482) 1994 PC1	0.3	16.8	1994 WR12	8.2	22.0	2004 XB45	8.0	26.2
(7753) 1988 XB	7.8	18.6	1995 SA	9.0	17.4	2004 XN50	8.3	18.8
(8566) 1996 EN	8.3	16.5	1996 AJ1	8.6	20.2	2005 AD13	8.8	17.9
(12538) 1998 OH	8.5	16.1	1996 JA1	8.6	21.0	2005 BS1	7.1	27.5
(12923) Zephyr	7.9	16.1	1996 RG3	5.8	18.5	2005 CC37	8.7	22.7
(13651) 1997 BR	8.4	17.6	1996 SK	4.7	16.9	2005 EU2	7.5	23.1
(16960) 1998 QS52	4.8	14.2	1997 GL3	5.6	19.5	2005 GY8	8.8	21.8
(20425) 1998 VD35	7.6	20.4	1997 US2	8.6	19.8	2005 GC120	8.7	19.7
(20826) 2000 UV13	7.6	13.5	1997 XR2	-5.3	20.8	2005 LW3	6.2	21.7
(23187) 2000 PN9	7.1	16.1	1998 HH49	8.6	21.3	2005 NZ6	7.2	17.6
(27002) 1998 DV9	5.0	18.2	1998 KM3	7.2	19.7	2005 NB7	7.5	18.7
(31669) 1999 JT6	3.9	16.0	1998 QA1	7.4	19.0	2005 QK76	8.9	25.1
(33342) 1998 WT24	7.9	17.9	1998 QK28	8.1	19.4	2005 QZ151	8.1	20.0
(35107) 1991 VH	9.0	16.9	1998 SC15	-0.7	19.4	2005 SQ	8.8	20.3
(35396) 1997 XF11	1.0	16.9	1999 RM45	6.2	19.4	2005 SE71	5.4	18.2
(37638) 1993 VB	1.6	19.4	1999 XS35	3.7	17.2	2005 TS15	8.8	20.9
(39572) 1993 DQ1	8.8	16.5	1999 XL136	7.1	19.8	2005 VC	8.6	17.2
(52768) 1998 OR2	9.0	16.2	1999 YR14	8.0	18.9	2005 VL1	1.1	27.0
(53319) 1999 JM8	8.9	15.3	2000 EJ26	8.5	19.3	2005 VN5	8.5	27.0
(54509) YORP	5.6	22.7	2000 EK26	2.8	18.0	2005 WK4	7.9	20.1
(66146) 1998 TU3	9.0	14.5	2000 GV147	6.3	19.2	2005 WY55	8.9	20.7
(66391) 1999 KW4	7.2	16.5	2000 KA	7.0	21.6	2005 XJ8	8.1	17.0
(68216) 2001 CV26	8.4	16.4	2000 QK130	3.1	20.9	2005 YU55	7.0	21.9
(68372) 2001 PM9	6.8	18.9	2000 RS11	8.7	19.1	2006 BC10	8.5	19.4
(68950) 2002 QF15	5.4	16.4	2000 TU28	6.2	21.0	2006 BM55	8.2	23.0
(69230) Hermes	5.4	17.5	2000 YG29	8.5	18.8	2006 CT	8.3	22.3

2006 DU62	5.8	18.0	2007 RY19	8.8	22.5	2008 PK3	4.9	22.0
2006 FX	6.3	20.0	2007 TB23	7.7	18.7	2008 QT3	8.3	18.4
2006 GY2	7.9	18.8	2007 TU24	5.9	20.3	<b>2008 QT3</b>	<b>8.7</b>	<b>18.8</b>
2006 JF42	6.3	19.0	2007 TH72	3.7	24.2	<b>2008 TC3</b>	<b>6.6</b>	<b>30.4</b>
2006 KV86	4.6	18.7	2007 UW1	8.6	22.7	<b>2008 TE</b>	<b>6.4</b>	<b>27.7</b>
2006 QV89	1.9	25.3	2007 UT3	7.9	25.9	<b>2008 UB7</b>	<b>8.7</b>	<b>23.9</b>
2006 RJ1	8.0	22.2	2007 UO6	8.1	27.3	<b>2008 UB9</b>	<b>8.3</b>	<b>24.7</b>
2006 SC	5.8	25.2	2007 VD184	7.9	23.1	<b>2008 UM1</b>	<b>8.5</b>	<b>32.1</b>
2006 SU49	-1.2	19.6	2007 VK184	6.1	22.0	<b>2008 WK9</b>	<b>7.4</b>	<b>23.1</b>
2006 VV2	7.8	16.8	2007 VE191	7.7	23.6	<b>2008 WZ1</b>	<b>8.2</b>	<b>18.7</b>
2006 WT1	7.5	20.1	2007 VN243	8.7	22.4	<b>2008 XM</b>	<b>8.3</b>	<b>19.8</b>
2007 AG	8.0	20.1	2008 AF4	6.5	19.7	<b>2008 XQ2</b>	<b>7.1</b>	<b>20.0</b>
2007 AB12	6.0	18.9	2008 CF22	7.2	26.0	<b>2008 YF</b>	<b>7.8</b>	<b>20.9</b>
2007 AE12	8.7	19.7	2008 CK70	7.6	25.4	<b>2008 YO2</b>	<b>8.8</b>	<b>25.2</b>
2007 CS5	8.8	24.6	2008 CC71	8.9	24.9	<b>2008 YQ2</b>	<b>5.2</b>	<b>22.6</b>
2007 CA19	2.0	17.6	2008 DE	8.3	19.6	<b>2008 YU3</b>	<b>9.0</b>	<b>19.9</b>
2007 CN26	7.8	21.1	2008 DJ	4.7	20.5	<b>2009 BH2</b>	<b>5.2</b>	<b>22.4</b>
2007 DX40	8.6	24.6	2008 EX5	8.7	23.8	<b>2009 BP5</b>	<b>6.7</b>	<b>22.7</b>
2007 EZ25	8.5	25.5	2008 ER7	5.7	20.0	<b>2009 DD4</b>	<b>8.6</b>	<b>25.8</b>
2007 FP3	8.8	28.4	2008 EM68	8.1	27.5	<b>2009 DE1</b>	<b>7.4</b>	<b>24.3</b>
2007 GU1	7.0	25.0	2008 GD110	7.2	24.5	<b>2009 EJ1</b>	<b>6.8</b>	<b>28.4</b>
2007 JD	7.7	23.1	2008 HB38	8.8	21.1	<b>2009 FG</b>	<b>8.7</b>	<b>25.5</b>
2007 JY2	4.3	21.7	2008 KO	2.5	24.4	<b>2009 FH</b>	<b>8.2</b>	<b>26.6</b>
2007 LF	8.0	20.5	2008 KZ5	7.2	20.0	<b>2009 FJ</b>	<b>7.9</b>	<b>24.9</b>
2007 LB15	8.5	19.4	2008 KN11	8.2	23.2	<b>2009 HG6</b>	<b>6.2</b>	<b>22.7</b>
2007 LQ19	0.5	17.3	2008 LA	8.7	23.1	<b>2009 JG2</b>	<b>1.7</b>	<b>22.6</b>
2007 PA8	8.1	16.1	2008 LV16	8.4	20.2	<b>2009 KC3</b>	<b>7.8</b>	<b>18.0</b>
2007 PV27	0.8	20.2	2008 MP1	8.0	21.9	<b>2009 KK</b>	<b>4.8</b>	<b>20.5</b>
2007 RU9	5.5	20.7	2008 OB9	6.2	17.4	<b>2009 KN4</b>	<b>8.9</b>	<b>18.4</b>

La magnitudine minima teorica sarebbe quella che l'asteroide avrebbe se fosse al suo MOID (minimum orbital intersection distance).

Magnitudine assoluta (H)	Diametro
3	670 km - 1490 km
3.5	530 km - 1190 km
4	420 km - 940 km
4.5	330 km - 750 km
5	270 km - 590 km
5.5	210 km - 470 km
6	170 km - 380 km
6.5	130 km - 300 km
7	110 km - 240 km
7.5	85 km - 190 km
8	65 km - 150 km

8.5	50 km - 120 km
9	40 km - 90 km
9.5	35 km - 75 km
10	25 km - 60 km
11	15 km - 40 km
12	11 km - 24 km
13	7 km - 15 km
14	4 km - 9 km
15	3 km - 6 km
16	2 km - 4 km
17	1 km - 2 km
18	670 m - 1500 m

19	420 m - 940 m
20	270 m - 590 m
21	170 m - 380 m
22	110 m - 240 m
23	65 m - 150 m
24	40 m - 95 m
25	25 m - 60 m
26	17 m - 37 m
27	11 m - 24 m
28	7 m - 15 m
29	4 m - 9 m
30	3 m - 6 m

# ELENCO ASTEROIDI CHE ALL'OPPOSIZIONE POTREBBERO SUPERARE 1" DI DIAMETRO ASTEROIDS THAT AT THE OPPOSITION THEY COULD OVERCOME 1" OF DIAMETER

(1) Ceres		1.1	2007 DS4	2.3	5.2
(4) Vesta		1.6	2007 EL38	3.4	7.5
(1981) Midas		1.9	2007 EN53	3.4	7.6
(2201) Oljato	2.1	4.7	2007 EO53	2	4.6
(4179) Toutatis		1.2	2007 EP56	2.9	6.5
(7482) 1994 PC1	3.3	7.3	2007 JG39	2	4.5
(31669) 1999 JT6		1.4	2007 JH39	2.6	5.9
(35396) 1997 XF11	2.3	5.1	2007 JJ39	3.1	6.8
(37638) 1993 VB	1.7	3.9	2007 JK39	2.2	4.8
(85236) 1993 KH		1.1	2007 JL39	4.1	9.1
(85713) 1998 SS49		1.9	2007 JG40	5.3	11.8
(89958) 2002 LY45		1.9	2007 KL	4.5	10
(89959) 2002 NT7	2.1	4.8	2007 KM	2.3	5.1
(90416) 2003 YK118		1.5	2007 KG1	3.3	7.4
(99942) Apophis	3	6.7	2007 KM1	2.8	6.2
(137108) 1999 AN10	2	4.4	2007 XS23	3.4	7.6
(141495) 2002 EZ11		1.6	2008 AS69	2.8	6.3
(143487) 2003 CR20	1.1	2.5	2008 DN1	3.5	7.9
(143649) 2003 QQ47		1	2008 EX80	2.7	6
(143651) 2003 QO104		1.2	2008 FR17	4.6	10.3
(162173) 1999 JU3		2	2008 FX24	2.1	4.8
(163132) 2002 CU11		2.2	2008 FY24	2.2	4.9
(163243) 2002 FB3		1.2	2008 FB25	3.4	7.7
(164121) 2003 YT1		1.4	2008 FH25	2.3	5.2
(177049) 2003 EE16	3.4	7.6	2008 FR27	2.7	6
1997 XR2	41.5	92.9	2008 FS27	2.1	4.8
1998 SC15	5	11.3	2008 FH50	2.3	5.2
1999 XS35		1.5	2008 FL50	3.7	8.3
2000 EK26		2.2	2008 FM55	2.6	5.8
2000 QK130		2	2008 FA56	3.6	8.1
2001 VK5	3.6	7.9	2008 FX58	1.8	3.9
2001 XU		1.3	2008 FA59	4	8.9
2002 EY2		2	2008 GU2	3.4	7.6
2002 EM7	5.7	12.6	2008 GB13	3.3	7.3
2002 NY40		1.4	2008 GG13	4.9	11
2003 DZ15		1.2	2008 GC20	3	6.7
2003 QC10		1.9	2008 JW30	2.4	5.5
2004 FH	1.5	3.4	2008 KQ5	3.9	8.7
2004 HE	2	4.6	2008 MH2	1.7	3.8
2004 RQ252		1	2008 MN2	3.3	7.4
2005 VL1	2.2	4.9	2008 MR2	2	4.6
2006 QV89	1.6	3.5	2008 MS2	2.6	5.8
2006 SU49	6.5	14.4	2008 MA3	4.9	11
2007 CA19	1.5	3.3	2008 MK3	4.2	9.3
2007 JY2		1.2	2008 QR5	4.2	9.3
2007 LQ19	2.9	6.5	2008 RJ69	2.4	5.3
2007 PV27	2.5	5.6	2008 RD70	3.5	7.9
2007 TH72		1.5	2008 RE70		2.2
2008 KO	1.1	2.6	2008 RZ92	2	4.5
2006 YO14	2.9	6.4	2009 JG2	1.7	3.8
2007 CR13	5.2	11.6			

I due valori si riferiscono al massimo diametro in " che l'asteroide può raggiungere in base ad un albedo pari a 0.05 o 0.025

# COMETE AL PERIELIO - COMETS AT PERIHELUM

Comet	T	q	P	N	H <sub>1</sub>	K <sub>1</sub>	Peak mag
118P/Shoemaker-Levy	Jan 2.3	1.98	6.45	3	8.7	10.0	12
82P/Gehrels	Jan 12.1	3.63	8.42	3	6.0	15.0	17
P/LINEAR-NEAT (2003 XD <sub>10</sub> )	Jan 31.9	1.99	6.29	1	15.5	10.0	20
203P/Korlevic	Feb 8.2	3.18	10.0	1	14.5	5.0	19
149P/Mueller	Feb 19.2	2.65	9.03	2	11.5	10.0	17
157P/Tritton	Feb 20.5	1.36	6.30	2	14.0	10.0	16
81P/Wild	Feb 22.7	1.60	6.42	5	6.9	11.4	9
126P/IRAS	Feb 22.8	1.71	13.4	2	8.5	15.0	14
P/McNaught (2004 R1)	Feb 23.7	0.99	5.48	1	18.5	10.0	20
65P/Gunn	Mar 2.1	2.44	6.79	7	5.0	15.0	12
P/LINEAR (2002 LZ <sub>11</sub> )	Mar 6.1	2.36	6.99	1	11.0	10.0	17
162P/Siding Spring	Mar 8.4	1.23	5.33	3	15.0	10.0	17
P/LINEAR-Skiff (2001 R6)	Mar 26.1	2.18	8.52	1	13.0	10.0	19
94P/Russell	Mar 29.7	2.24	6.60	4	9.0	15.0	15
30P/Reinmuth	Apr 19.5	1.88	7.34	10	9.5	15.0	15
Spacewatch (2007 VO <sub>5</sub> )	Apr 26.8	4.85			7.0	10.0	17
S02P/SOHO	May 1.5	0.05	5.50	2			
104P/Kowal	May 4.6	1.18	5.89	4	9.8	9.3	12
141P-Machholz-A	May 24.5	0.76	5.24	3	13.0	10.5	13
141P-Machholz-D	May 29.7	0.76	5.25	2	13.4	29.8	?
142P/Ge-Wang	May 30.5	2.49	11.1	2	12.3	11.0	17
D/Haneda-Campos (1978 R1)	Jun 7.4	1.28	6.42	1	13.5	10.0	?
P/NEAT (2002 O8)	Jun 8.4	3.21	8.07	1	8.0	10.0	15
43P/Wolf-Harrington	Jul 1.7	1.36	6.12	10	8.9	10.0	12
10P/Tempel	Jul 4.9	1.42	5.37	22	9.0	12.5	10
S03P/SOHO*	Jul 17.0	0.05	5.38	2			
P/LINEAR (1999 U3)	Jul 18.5	1.92	11.0	1	13.5	10.0	18
2P/Encke	Aug 6.5	0.34	3.30	60	10.5	15.0	4
P/Skiff (2002 S1)	Aug 14.7	2.42	8.45	1	11.0	10.0	16
P/Catalina-LINEAR (2004 EW <sub>38</sub> )	Sep 3.7	1.79	6.80	1	16.5	5.0	20
P/LINEAR (2002 UY <sub>215</sub> )	Sep 9.5	1.83	7.21	1	14.0	10.0	17
31P/Schwassmann-Wachmann	Sep 29.5	3.42	8.74	12	6.7	11.3	15
Lemmon-Siding Spring (2008 FK <sub>7</sub> )	Sep 29.7	4.51			5.0	10.0	15
P/NEAT (2002 X2)	Oct 4.9	2.13	7.60	1	12.0	10.0	16
D/van Houten (1960 S1)	Oct 16.3	4.14	16.6	1	9.0	10.0	19?
103P/Hartley	Oct 28.3	1.06	6.47	4	8.7	24.0	5
S03P/SOHO*	Oct 29.8	0.05	5.67	2			
P/LINEAR (2000 G1)	Nov 13.9	1.00	5.34	1	19.5	5.0	21
P/LINEAR (2004 HC <sub>18</sub> )	Dec 29.6	1.71	6.52	1	16.5	5.0	20

T = epoca del perielio  
 q = perielio  
 P = periodo  
 N = numero di passaggi dall'anno della scoperta  
 H,K = parametri per il calcolo della luminosità  
 Peak = massima magnitudine prevista

T = epoch of perihelium  
 q = perihelium  
 P = period  
 N = number of return since discovery  
 H,K = parameters of brightness  
 Peak = max magnitude

# COMETE CON m<9

## COMETS WITH m<9

2P/Encke      yyyy mm dd.dddd      q      e      per.      nodo      i      G      H  
 2010 08 06.6165    0.337241      0.847835    186.4964    334.5674    11.7814    11.5    6.0

Date	Time	AR	Dec	R	D	Elong.	[mag]
		[h m s]	[° ' ]	[AU]	[AU]	[ ° ]	
-----	-----	-----	-----	-----	-----	-----	-----
2010.07.19	00.00	06.49.15	+27°35'	0.604	1.512	15.9° W	9.1
2010.07.20	00.00	06.56.50	+27°17'	0.585	1.502	15.1° W	8.9
2010.07.21	00.00	07.04.31	+26°57'	0.567	1.492	14.4° W	8.7
2010.07.22	00.00	07.12.20	+26°35'	0.549	1.482	13.5° W	8.4
2010.07.23	00.00	07.20.14	+26°11'	0.531	1.473	12.6° W	8.2
2010.07.24	00.00	07.28.15	+25°44'	0.513	1.464	11.7° W	8.0
2010.07.25	00.00	07.36.22	+25°15'	0.495	1.455	10.8° W	7.7
2010.07.26	00.00	07.44.34	+24°43'	0.478	1.446	9.8° W	7.5
2010.07.27	00.00	07.52.52	+24°09'	0.461	1.437	8.8° W	7.2
2010.07.28	00.00	08.01.14	+23°32'	0.445	1.429	7.7° W	7.0
2010.07.29	00.00	08.09.42	+22°53'	0.429	1.421	6.6° W	6.7
2010.07.30	00.00	08.18.13	+22°11'	0.414	1.412	5.5° W	6.5
2010.07.31	00.00	08.26.49	+21°26'	0.400	1.404	4.4° W	6.3
2010.08.01	00.00	08.35.28	+20°38'	0.387	1.396	3.2° W	6.0
2010.08.02	00.00	08.44.09	+19°47'	0.375	1.387	2.1° W	5.8
2010.08.03	00.00	08.52.52	+18°54'	0.364	1.378	1.3° E	5.6
2010.08.04	00.00	09.01.37	+17°58'	0.355	1.369	1.6° E	5.4
2010.08.05	00.00	09.10.21	+17°00'	0.348	1.359	2.6° E	5.3
2010.08.06	00.00	09.19.04	+15°59'	0.343	1.349	3.9° E	5.2
2010.08.07	00.00	09.27.45	+14°57'	0.340	1.338	5.2° E	5.1
2010.08.08	00.00	09.36.23	+13°52'	0.339	1.327	6.6° E	5.1
2010.08.09	00.00	09.44.57	+12°47'	0.341	1.315	8.0° E	5.1
2010.08.10	00.00	09.53.26	+11°40'	0.344	1.303	9.4° E	5.1
2010.08.11	00.00	10.01.49	+10°32'	0.349	1.290	10.8° E	5.2
2010.08.12	00.00	10.10.06	+09°24'	0.357	1.278	12.2° E	5.3
2010.08.13	00.00	10.18.17	+08°15'	0.366	1.265	13.5° E	5.5
2010.08.14	00.00	10.26.23	+07°06'	0.377	1.252	14.9° E	5.6
2010.08.15	00.00	10.34.22	+05°58'	0.389	1.240	16.2° E	5.8
2010.08.16	00.00	10.42.16	+04°49'	0.402	1.228	17.6° E	6.0
2010.08.17	00.00	10.50.05	+03°41'	0.416	1.217	18.9° E	6.2
2010.08.18	00.00	10.57.50	+02°33'	0.432	1.206	20.2° E	6.4
2010.08.19	00.00	11.05.31	+01°25'	0.448	1.195	21.4° E	6.7
2010.08.20	00.00	11.13.08	+00°18'	0.464	1.186	22.7° E	6.9
2010.08.21	00.00	11.20.42	-00°48'	0.481	1.177	24.0° E	7.1
2010.08.22	00.00	11.28.14	-01°54'	0.498	1.169	25.2° E	7.3
2010.08.23	00.00	11.35.43	-02°59'	0.516	1.161	26.4° E	7.5
2010.08.24	00.00	11.43.10	-04°03'	0.534	1.155	27.6° E	7.7
2010.08.25	00.00	11.50.36	-05°06'	0.552	1.149	28.8° E	7.9
2010.08.26	00.00	11.58.00	-06°08'	0.570	1.144	29.9° E	8.1
2010.08.27	00.00	12.05.22	-07°10'	0.589	1.140	31.1° E	8.3
2010.08.28	00.00	12.12.43	-08°10'	0.607	1.137	32.2° E	8.5
2010.08.29	00.00	12.20.02	-09°09'	0.625	1.135	33.3° E	8.7
2010.08.30	00.00	12.27.20	-10°07'	0.644	1.134	34.4° E	8.9
2010.08.31	00.00	12.34.37	-11°03'	0.662	1.133	35.5° E	9.1

Date = data nel formato gg/mm/aaaa  
 A.R. e DEC. = coordinate per Roma (42°N, 12°E)  
 R = distanza dal Sole in U.A.  
 D = distanza dalla Terra in U.A.  
 Elong. = elongazione dal Sole in °  
 Mag = magnitudine

Date	Object			Morning twilight				-12°	Evening twilight			
	Rise	Transit	Set	Time	Alt	Az	Elong		Time	Alt	Az	Elon
-----	-----	-----	-----	-----	-----	-----	-----		-----	-----	-----	-----
2010.07.19	03:18	11:14	19:10	03:37	2.3	54.2	15.8		20:55	-13.6	328.3	15.3
2010.07.20	03:23	11:18	19:12	03:38	1.7	54.0	15.1		20:54	-13.4	327.2	14.5
2010.07.21	03:28	11:22	19:14	03:40	1.1	53.8	14.3		20:53	-13.2	326.0	13.7
2010.07.22	03:34	11:26	19:16	03:41	0.4	53.6	13.4		20:52	-13.0	324.8	12.8
2010.07.23	03:40	11:30	19:18	03:42	-0.3	53.4	12.5		20:51	-12.8	323.5	11.9
2010.07.24	03:47	11:34	19:20	03:43	-1.1	53.2	11.6		20:50	-12.7	322.2	11.0
2010.07.25	03:53	11:38	19:21	03:44	-1.9	53.0	10.7		20:49	-12.5	320.8	10.0
2010.07.26	04:00	11:43	19:23	03:46	-2.8	52.8	9.7		20:47	-12.3	319.4	9.0
2010.07.27	04:07	11:47	19:25	03:47	-3.7	52.7	8.7		20:46	-12.1	318.0	7.9
2010.07.28	04:15	11:51	19:26	03:48	-4.6	52.5	7.6		20:45	-11.9	316.5	6.8
2010.07.29	04:22	11:56	19:27	03:49	-5.6	52.4	6.5		20:44	-11.7	314.9	5.7
2010.07.30	04:30	12:01	19:29	03:51	-6.6	52.2	5.4		20:42	-11.5	313.3	4.6
2010.07.31	04:39	12:05	19:30	03:52	-7.7	52.1	4.2		20:41	-11.3	311.7	3.4
2010.08.01	04:47	12:10	19:31	03:53	-8.9	52.0	3.1		20:39	-11.1	310.0	2.3
2010.08.02	04:55	12:15	19:32	03:55	-10.0	51.9	2.0		20:38	-10.9	308.3	1.4
2010.08.03	05:04	12:20	19:33	03:56	-11.2	51.8	1.3		20:37	-10.7	306.5	1.4
2010.08.04	05:13	12:24	19:34	03:57	-12.5	51.7	1.7		20:35	-10.5	304.7	2.4
2010.08.05	05:22	12:29	19:34	03:58	-13.8	51.7	2.8		20:34	-10.3	302.9	3.6
2010.08.06	05:31	12:34	19:35	04:00	-15.1	51.6	4.0		20:32	-10.1	301.0	5.0
2010.08.07	05:40	12:39	19:35	04:01	-16.4	51.6	5.4		20:31	-9.9	299.2	6.3
2010.08.08	05:49	12:43	19:36	04:02	-17.8	51.6	6.8		20:29	-9.7	297.3	7.7
2010.08.09	05:58	12:48	19:36	04:04	-19.2	51.6	8.2		20:27	-9.5	295.4	9.1
2010.08.10	06:06	12:53	19:36	04:05	-20.5	51.6	9.6		20:26	-9.3	293.6	10.5
2010.08.11	06:15	12:57	19:36	04:06	-21.9	51.7	11.0		20:24	-9.1	291.7	11.9
2010.08.12	06:24	13:01	19:36	04:08	-23.2	51.8	12.3		20:23	-8.9	289.8	13.3
2010.08.13	06:32	13:05	19:36	04:09	-24.6	51.9	13.7		20:21	-8.7	288.0	14.6
2010.08.14	06:41	13:10	19:36	04:10	-25.9	52.0	15.1		20:19	-8.4	286.1	16.0
2010.08.15	06:49	13:14	19:36	04:11	-27.3	52.1	16.4		20:18	-8.2	284.3	17.3
2010.08.16	06:57	13:17	19:36	04:13	-28.6	52.3	17.7		20:16	-8.0	282.5	18.6
2010.08.17	07:05	13:21	19:35	04:14	-29.9	52.5	19.1		20:14	-7.7	280.7	19.9
2010.08.18	07:13	13:25	19:35	04:15	-31.2	52.7	20.3		20:12	-7.5	279.0	21.2
2010.08.19	07:21	13:29	19:35	04:17	-32.4	52.9	21.6		20:11	-7.3	277.2	22.5
2010.08.20	07:29	13:32	19:34	04:18	-33.7	53.1	22.9		20:09	-7.0	275.5	23.7
2010.08.21	07:36	13:36	19:34	04:19	-34.9	53.3	24.1		20:07	-6.8	273.8	24.9
2010.08.22	07:44	13:40	19:34	04:20	-36.1	53.5	25.3		20:05	-6.5	272.1	26.1
2010.08.23	07:51	13:43	19:33	04:22	-37.3	53.8	26.6		20:04	-6.2	270.4	27.3
2010.08.24	07:59	13:47	19:33	04:23	-38.5	54.0	27.8		20:02	-5.9	268.7	28.5
2010.08.25	08:06	13:50	19:33	04:24	-39.7	54.3	28.9		20:00	-5.7	267.1	29.7
2010.08.26	08:13	13:54	19:32	04:25	-40.9	54.5	30.1		19:58	-5.4	265.4	30.8
2010.08.27	08:20	13:57	19:32	04:27	-42.0	54.8	31.2		19:56	-5.1	263.8	32.0
2010.08.28	08:27	14:00	19:32	04:28	-43.1	55.1	32.4		19:55	-4.8	262.2	33.1
2010.08.29	08:34	14:04	19:32	04:29	-44.2	55.3	33.5		19:53	-4.5	260.6	34.2
2010.08.30	08:41	14:07	19:31	04:30	-45.3	55.6	34.5		19:51	-4.1	259.1	35.2
2010.08.31	08:48	14:10	19:31	04:32	-46.4	55.8	35.6		19:49	-3.8	257.5	36.3

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

Times of rising and setting of the comet for Rome (42°N, 12°E), in U.T.+1

10P/Tempel      yyyy mm dd.ddd      q      e      per.      nodo      i      G      H  
2010 07 4.9073    1.422698      0.536334    195.6608    117.8251    12.0223    5.0    10.0

Date	Time	AR	Dec	R	D	Elong.	[mag]
		[h m s]	[° ' ]	[AU]	[AU]	[ ° ]	
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2010.06.01	00.00	22.16.37	-07°50'	1.467	0.941	97.2° W	9.0
2010.06.02	00.00	22.19.40	-07°45'	1.464	0.934	97.4° W	9.0
2010.06.03	00.00	22.22.43	-07°41'	1.462	0.927	97.6° W	9.0
2010.06.04	00.00	22.25.47	-07°37'	1.460	0.920	97.8° W	8.9
2010.06.05	00.00	22.28.51	-07°33'	1.457	0.913	98.1° W	8.9
2010.06.06	00.00	22.31.54	-07°29'	1.455	0.907	98.3° W	8.9
2010.06.07	00.00	22.34.58	-07°25'	1.453	0.900	98.5° W	8.8
2010.06.08	00.00	22.38.01	-07°22'	1.451	0.893	98.8° W	8.8
2010.06.09	00.00	22.41.04	-07°18'	1.449	0.887	99.0° W	8.8
2010.06.10	00.00	22.44.08	-07°15'	1.447	0.881	99.2° W	8.7
2010.06.11	00.00	22.47.11	-07°12'	1.445	0.875	99.5° W	8.7
2010.06.12	00.00	22.50.13	-07°08'	1.443	0.869	99.7° W	8.7
2010.06.13	00.00	22.53.16	-07°06'	1.441	0.863	99.9° W	8.6
2010.06.14	00.00	22.56.19	-07°03'	1.440	0.857	100.2° W	8.6
2010.06.15	00.00	22.59.21	-07°00'	1.438	0.851	100.4° W	8.6
2010.06.16	00.00	23.02.22	-06°58'	1.437	0.845	100.7° W	8.6
2010.06.17	00.00	23.05.24	-06°56'	1.435	0.840	100.9° W	8.5
2010.06.18	00.00	23.08.25	-06°54'	1.434	0.834	101.2° W	8.5
2010.06.19	00.00	23.11.25	-06°52'	1.433	0.829	101.4° W	8.5
2010.06.20	00.00	23.14.26	-06°50'	1.431	0.823	101.7° W	8.5
2010.06.21	00.00	23.17.25	-06°49'	1.430	0.818	101.9° W	8.4
2010.06.22	00.00	23.20.24	-06°48'	1.429	0.813	102.2° W	8.4
2010.06.23	00.00	23.23.23	-06°47'	1.428	0.808	102.5° W	8.4
2010.06.24	00.00	23.26.20	-06°46'	1.427	0.803	102.7° W	8.4
2010.06.25	00.00	23.29.18	-06°45'	1.427	0.798	103.0° W	8.4
2010.06.26	00.00	23.32.14	-06°45'	1.426	0.793	103.3° W	8.3
2010.06.27	00.00	23.35.09	-06°45'	1.425	0.789	103.6° W	8.3
2010.06.28	00.00	23.38.04	-06°45'	1.425	0.784	103.8° W	8.3
2010.06.29	00.00	23.40.58	-06°45'	1.424	0.780	104.1° W	8.3
2010.06.30	00.00	23.43.51	-06°46'	1.424	0.775	104.4° W	8.3
2010.07.01	00.00	23.46.43	-06°46'	1.423	0.771	104.7° W	8.3
2010.07.02	00.00	23.49.34	-06°48'	1.423	0.767	105.0° W	8.3
2010.07.03	00.00	23.52.24	-06°49'	1.423	0.762	105.3° W	8.2
2010.07.04	00.00	23.55.13	-06°50'	1.423	0.758	105.6° W	8.2
2010.07.05	00.00	23.58.01	-06°52'	1.423	0.754	105.9° W	8.2
2010.07.06	00.00	00.00.47	-06°54'	1.423	0.750	106.3° W	8.2
2010.07.07	00.00	00.03.33	-06°57'	1.423	0.747	106.6° W	8.2
2010.07.08	00.00	00.06.17	-06°59'	1.423	0.743	106.9° W	8.2
2010.07.09	00.00	00.08.59	-07°02'	1.423	0.739	107.3° W	8.2
2010.07.10	00.00	00.11.40	-07°05'	1.424	0.736	107.6° W	8.2
2010.07.11	00.00	00.14.20	-07°08'	1.424	0.732	107.9° W	8.2
2010.07.12	00.00	00.16.58	-07°12'	1.425	0.729	108.3° W	8.2
2010.07.13	00.00	00.19.35	-07°16'	1.425	0.725	108.7° W	8.1
2010.07.14	00.00	00.22.10	-07°20'	1.426	0.722	109.0° W	8.1
2010.07.15	00.00	00.24.43	-07°25'	1.427	0.719	109.4° W	8.1
2010.07.16	00.00	00.27.15	-07°29'	1.427	0.716	109.8° W	8.1
2010.07.17	00.00	00.29.45	-07°34'	1.428	0.713	110.2° W	8.1
2010.07.18	00.00	00.32.13	-07°40'	1.429	0.710	110.6° W	8.1
2010.07.19	00.00	00.34.39	-07°45'	1.430	0.707	111.0° W	8.1
2010.07.20	00.00	00.37.03	-07°51'	1.431	0.704	111.4° W	8.1
2010.07.21	00.00	00.39.25	-07°57'	1.433	0.701	111.8° W	8.1
2010.07.22	00.00	00.41.45	-08°03'	1.434	0.698	112.2° W	8.1
2010.07.23	00.00	00.44.03	-08°10'	1.435	0.696	112.6° W	8.1
2010.07.24	00.00	00.46.19	-08°17'	1.437	0.693	113.1° W	8.1
2010.07.25	00.00	00.48.33	-08°24'	1.438	0.691	113.5° W	8.1
2010.07.26	00.00	00.50.44	-08°32'	1.440	0.688	113.9° W	8.1
2010.07.27	00.00	00.52.54	-08°39'	1.441	0.686	114.4° W	8.2
2010.07.28	00.00	00.55.01	-08°47'	1.443	0.684	114.9° W	8.2
2010.07.29	00.00	00.57.05	-08°55'	1.445	0.682	115.3° W	8.2
2010.07.30	00.00	00.59.07	-09°04'	1.447	0.680	115.8° W	8.2
2010.07.31	00.00	01.01.06	-09°13'	1.449	0.678	116.3° W	8.2
2010.08.01	00.00	01.03.03	-09°22'	1.451	0.676	116.8° W	8.2
2010.08.02	00.00	01.04.58	-09°31'	1.453	0.674	117.3° W	8.2
2010.08.03	00.00	01.06.50	-09°40'	1.455	0.672	117.8° W	8.2
2010.08.04	00.00	01.08.39	-09°50'	1.457	0.670	118.3° W	8.2
2010.08.05	00.00	01.10.25	-10°00'	1.460	0.668	118.9° W	8.2
2010.08.06	00.00	01.12.08	-10°10'	1.462	0.667	119.4° W	8.2
2010.08.07	00.00	01.13.49	-10°21'	1.464	0.665	119.9° W	8.3
2010.08.08	00.00	01.15.27	-10°31'	1.467	0.664	120.5° W	8.3
2010.08.09	00.00	01.17.02	-10°42'	1.469	0.662	121.0° W	8.3
2010.08.10	00.00	01.18.34	-10°53'	1.472	0.661	121.6° W	8.3
2010.08.11	00.00	01.20.03	-11°04'	1.475	0.660	122.2° W	8.3
2010.08.12	00.00	01.21.30	-11°15'	1.478	0.659	122.8° W	8.3



Date	Time	AR	Dec	R	D	Elong.	[mag]
		[h m s]	[° ' ]	[AU]	[AU]	[ ° ]	
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2010.08.13	00.00	01.22.53	-11°27'	1.480	0.658	123.4° W	8.3
2010.08.14	00.00	01.24.13	-11°39'	1.483	0.657	123.9° W	8.4
2010.08.15	00.00	01.25.30	-11°50'	1.486	0.656	124.6° W	8.4
2010.08.16	00.00	01.26.44	-12°03'	1.489	0.655	125.2° W	8.4
2010.08.17	00.00	01.27.54	-12°15'	1.492	0.654	125.8° W	8.4
2010.08.18	00.00	01.29.02	-12°27'	1.496	0.653	126.4° W	8.4
2010.08.19	00.00	01.30.06	-12°39'	1.499	0.653	127.0° W	8.5
2010.08.20	00.00	01.31.07	-12°52'	1.502	0.652	127.7° W	8.5
2010.08.21	00.00	01.32.05	-13°04'	1.505	0.652	128.3° W	8.5
2010.08.22	00.00	01.33.00	-13°17'	1.509	0.651	129.0° W	8.5
2010.08.23	00.00	01.33.51	-13°30'	1.512	0.651	129.6° W	8.6
2010.08.24	00.00	01.34.40	-13°43'	1.516	0.651	130.3° W	8.6
2010.08.25	00.00	01.35.24	-13°55'	1.519	0.651	131.0° W	8.6
2010.08.26	00.00	01.36.06	-14°08'	1.523	0.651	131.6° W	8.6
2010.08.27	00.00	01.36.44	-14°21'	1.527	0.651	132.3° W	8.7
2010.08.28	00.00	01.37.19	-14°34'	1.530	0.651	133.0° W	8.7
2010.08.29	00.00	01.37.51	-14°47'	1.534	0.651	133.7° W	8.7
2010.08.30	00.00	01.38.20	-15°00'	1.538	0.652	134.4° W	8.7
2010.08.31	00.00	01.38.45	-15°12'	1.542	0.652	135.0° W	8.8
2010.09.01	00.00	01.39.07	-15°25'	1.546	0.653	135.7° W	8.8
2010.09.02	00.00	01.39.26	-15°38'	1.550	0.654	136.4° W	8.8
2010.09.03	00.00	01.39.42	-15°50'	1.554	0.655	137.1° W	8.9
2010.09.04	00.00	01.39.55	-16°03'	1.558	0.656	137.8° W	8.9
2010.09.05	00.00	01.40.04	-16°15'	1.562	0.657	138.5° W	8.9
2010.09.06	00.00	01.40.11	-16°27'	1.566	0.658	139.2° W	9.0
2010.09.07	00.00	01.40.14	-16°39'	1.570	0.659	139.9° W	9.0
2010.09.08	00.00	01.40.15	-16°51'	1.575	0.661	140.6° W	9.0

Date = data nel formato gg/mm/aaaa  
 A.R. e DEC. = coordinate per Roma (42°N, 12°E)  
 R = distanza dal Sole in U.A.  
 D = distanza dalla Terra in U.A.  
 Elong. = elongazione dal Sole in °  
 Mag = magnitudine

Date	Object			Morning twilight -18°				Evening twilight			
	Rise	Transit	Set	Time	Alt	Az	Elong	Time	Alt	Az	Elon
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2010.06.01	00:14	05:49	11:24	02:31	22.8	125.1	97.2	21:45	-28.0	74.3	97.4
2010.06.02	00:13	05:48	11:23	02:30	22.8	125.0	97.4	21:46	-27.6	74.6	97.6
2010.06.03	00:12	05:47	11:23	02:29	22.9	125.0	97.7	21:47	-27.1	75.0	97.8
2010.06.04	00:11	05:46	11:22	02:28	22.9	124.9	97.9	21:48	-26.7	75.3	98.1
2010.06.05	00:10	05:46	11:21	02:27	23.0	124.9	98.1	21:50	-26.3	75.7	98.3
2010.06.06	00:09	05:45	11:21	02:27	23.1	124.9	98.3	21:51	-25.9	76.0	98.5
2010.06.07	00:08	05:44	11:20	02:26	23.2	124.9	98.6	21:52	-25.5	76.3	98.8
2010.06.08	00:07	05:43	11:19	02:25	23.3	124.9	98.8	21:53	-25.1	76.6	99.0
2010.06.09	00:05	05:42	11:19	02:25	23.3	124.9	99.0	21:54	-24.7	76.9	99.2
2010.06.10	00:04	05:41	11:18	02:24	23.4	125.0	99.3	21:55	-24.4	77.2	99.5
2010.06.11	00:03	05:40	11:17	02:24	23.6	125.1	99.5	21:56	-24.0	77.5	99.7
2010.06.12	00:02	05:39	11:17	02:23	23.7	125.1	99.7	21:56	-23.7	77.7	99.9
2010.06.13	00:01	05:38	11:16	02:23	23.8	125.2	100.0	21:57	-23.4	78.0	100.2
2010.06.14	00:00	05:38	11:15	02:23	23.9	125.3	100.2	21:58	-23.0	78.3	100.4
2010.06.15	23:58	05:37	11:14	02:23	24.1	125.4	100.5	21:58	-22.7	78.5	100.7
2010.06.16	23:57	05:36	11:14	02:22	24.2	125.6	100.7	21:59	-22.4	78.8	100.9
2010.06.17	23:56	05:35	11:13	02:22	24.4	125.7	101.0	21:59	-22.1	79.0	101.2
2010.06.18	23:55	05:34	11:12	02:22	24.5	125.9	101.2	22:00	-21.9	79.2	101.4
2010.06.19	23:54	05:33	11:11	02:22	24.7	126.1	101.5	22:00	-21.6	79.4	101.7
2010.06.20	23:53	05:32	11:10	02:23	24.9	126.3	101.7	22:01	-21.4	79.6	101.9
2010.06.21	23:52	05:31	11:09	02:23	25.1	126.6	102.0	22:01	-21.1	79.8	102.2
2010.06.22	23:51	05:30	11:09	02:23	25.3	126.8	102.2	22:01	-20.9	80.0	102.5
2010.06.23	23:50	05:29	11:08	02:23	25.5	127.1	102.5	22:01	-20.7	80.2	102.7
2010.06.24	23:49	05:28	11:07	02:24	25.7	127.4	102.8	22:01	-20.5	80.4	103.0
2010.06.25	23:48	05:27	11:06	02:24	25.9	127.7	103.0	22:01	-20.3	80.6	103.3
2010.06.26	23:47	05:26	11:05	02:25	26.1	128.0	103.3	22:01	-20.1	80.7	103.5
2010.06.27	23:46	05:25	11:04	02:25	26.4	128.4	103.6	22:01	-20.0	80.9	103.8
2010.06.28	23:44	05:24	11:03	02:26	26.6	128.7	103.9	22:01	-19.8	81.1	104.1
2010.06.29	23:43	05:23	11:02	02:26	26.9	129.1	104.2	22:00	-19.7	81.2	104.4
2010.06.30	23:42	05:22	11:00	02:27	27.1	129.5	104.5	22:00	-19.6	81.3	104.7
2010.07.01	23:41	05:21	10:59	02:28	27.4	130.0	104.8	22:00	-19.4	81.5	105.0
2010.07.02	23:40	05:20	10:58	02:29	27.6	130.4	105.1	21:59	-19.3	81.6	105.3
2010.07.03	23:39	05:19	10:57	02:30	27.9	130.9	105.4	21:59	-19.2	81.7	105.6
2010.07.04	23:38	05:18	10:56	02:31	28.2	131.4	105.7	21:58	-19.2	81.9	105.9

Date	Object			Morning twilight				Evening twilight			
	Rise	Transit	Set	Time	Alt	Az	Elong	Time	Alt	Az	Elon
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
2010.07.05	23:37	05:16	10:54	02:32	28.4	131.9	106.0	21:58	-19.1	82.0	106.3
2010.07.06	23:36	05:15	10:53	02:33	28.7	132.5	106.3	21:57	-19.0	82.1	106.6
2010.07.07	23:35	05:14	10:52	02:34	29.0	133.0	106.6	21:56	-19.0	82.2	106.9
2010.07.08	23:34	05:13	10:50	02:35	29.3	133.6	107.0	21:55	-18.9	82.3	107.2
2010.07.09	23:33	05:12	10:49	02:36	29.5	134.2	107.3	21:54	-18.9	82.4	107.6
2010.07.10	23:32	05:10	10:48	02:37	29.8	134.8	107.7	21:54	-18.8	82.5	107.9
2010.07.11	23:31	05:09	10:46	02:38	30.1	135.5	108.0	21:53	-18.8	82.6	108.3
2010.07.12	23:30	05:08	10:44	02:40	30.4	136.2	108.4	21:52	-18.8	82.8	108.6
2010.07.13	23:29	05:06	10:43	02:41	30.7	136.8	108.7	21:51	-18.8	82.9	109.0
2010.07.14	23:28	05:05	10:41	02:42	31.0	137.6	109.1	21:49	-18.8	83.0	109.4
2010.07.15	23:26	05:04	10:40	02:44	31.2	138.3	109.5	21:48	-18.8	83.1	109.8
2010.07.16	23:25	05:02	10:38	02:45	31.5	139.0	109.8	21:47	-18.8	83.2	110.1
2010.07.17	23:24	05:01	10:36	02:47	31.8	139.8	110.2	21:46	-18.8	83.3	110.5
2010.07.18	23:23	04:59	10:34	02:48	32.1	140.6	110.6	21:45	-18.9	83.4	110.9
2010.07.19	23:22	04:58	10:32	02:49	32.3	141.4	111.0	21:43	-18.9	83.5	111.3
2010.07.20	23:21	04:56	10:30	02:51	32.6	142.3	111.4	21:42	-18.9	83.6	111.7
2010.07.21	23:19	04:55	10:29	02:52	32.8	143.1	111.8	21:40	-18.9	83.7	112.2
2010.07.22	23:18	04:53	10:26	02:54	33.1	144.0	112.3	21:39	-19.0	83.9	112.6
2010.07.23	23:17	04:51	10:24	02:55	33.3	144.9	112.7	21:38	-19.0	84.0	113.0
2010.07.24	23:16	04:50	10:22	02:57	33.6	145.9	113.1	21:36	-19.1	84.1	113.5
2010.07.25	23:14	04:48	10:20	02:59	33.8	146.8	113.6	21:35	-19.1	84.3	113.9
2010.07.26	23:13	04:46	10:18	03:00	34.0	147.8	114.0	21:33	-19.1	84.4	114.4
2010.07.27	23:12	04:44	10:16	03:02	34.2	148.8	114.5	21:31	-19.2	84.5	114.8
2010.07.28	23:10	04:43	10:13	03:03	34.4	149.8	114.9	21:30	-19.2	84.7	115.3
2010.07.29	23:09	04:41	10:11	03:05	34.6	150.8	115.4	21:28	-19.3	84.9	115.8
2010.07.30	23:08	04:39	10:08	03:06	34.8	151.8	115.9	21:26	-19.3	85.0	116.3
2010.07.31	23:06	04:37	10:06	03:08	35.0	152.9	116.4	21:25	-19.4	85.2	116.8
2010.08.01	23:05	04:35	10:03	03:10	35.1	154.0	116.9	21:23	-19.4	85.4	117.3
2010.08.02	23:03	04:33	10:01	03:11	35.3	155.1	117.4	21:21	-19.4	85.5	117.8
2010.08.03	23:02	04:31	09:58	03:13	35.4	156.2	117.9	21:20	-19.5	85.7	118.3
2010.08.04	23:00	04:29	09:55	03:15	35.5	157.3	118.4	21:18	-19.5	85.9	118.8
2010.08.05	22:58	04:26	09:52	03:16	35.6	158.5	119.0	21:16	-19.6	86.1	119.4
2010.08.06	22:57	04:24	09:50	03:18	35.7	159.7	119.5	21:14	-19.6	86.4	119.9
2010.08.07	22:55	04:22	09:47	03:19	35.8	160.9	120.0	21:12	-19.6	86.6	120.4
2010.08.08	22:54	04:20	09:44	03:21	35.9	162.1	120.6	21:10	-19.6	86.8	121.0
2010.08.09	22:52	04:17	09:41	03:23	35.9	163.3	121.1	21:09	-19.7	87.0	121.6
2010.08.10	22:50	04:15	09:38	03:24	35.9	164.5	121.7	21:07	-19.7	87.3	122.1
2010.08.11	22:48	04:12	09:34	03:26	35.9	165.8	122.3	21:05	-19.7	87.5	122.7
2010.08.12	22:46	04:10	09:31	03:27	35.9	167.0	122.9	21:03	-19.7	87.8	123.3
2010.08.13	22:45	04:07	09:28	03:29	35.9	168.3	123.5	21:01	-19.7	88.1	123.9
2010.08.14	22:43	04:05	09:24	03:30	35.9	169.6	124.1	20:59	-19.7	88.4	124.5
2010.08.15	22:41	04:02	09:21	03:32	35.8	170.9	124.7	20:57	-19.7	88.6	125.1
2010.08.16	22:39	03:59	09:18	03:33	35.7	172.2	125.3	20:55	-19.7	88.9	125.7
2010.08.17	22:37	03:57	09:14	03:35	35.6	173.5	125.9	20:53	-19.6	89.3	126.4
2010.08.18	22:35	03:54	09:10	03:37	35.5	174.8	126.5	20:51	-19.6	89.6	127.0
2010.08.19	22:33	03:51	09:07	03:38	35.4	176.2	127.2	20:49	-19.6	89.9	127.6
2010.08.20	22:30	03:48	09:03	03:40	35.2	177.5	127.8	20:47	-19.5	90.2	128.3
2010.08.21	22:28	03:45	08:59	03:41	35.0	178.8	128.5	20:45	-19.4	90.6	128.9
2010.08.22	22:26	03:42	08:55	03:43	34.8	180.2	129.1	20:43	-19.4	90.9	129.6
2010.08.23	22:24	03:39	08:51	03:44	34.6	181.5	129.8	20:41	-19.3	91.3	130.2
2010.08.24	22:21	03:36	08:47	03:45	34.3	182.9	130.4	20:39	-19.2	91.7	130.9
2010.08.25	22:19	03:32	08:43	03:47	34.1	184.2	131.1	20:37	-19.1	92.0	131.6
2010.08.26	22:16	03:29	08:39	03:48	33.8	185.6	131.8	20:35	-19.0	92.4	132.2
2010.08.27	22:14	03:26	08:35	03:50	33.5	187.0	132.4	20:33	-18.9	92.8	132.9
2010.08.28	22:11	03:23	08:31	03:51	33.1	188.3	133.1	20:31	-18.8	93.2	133.6
2010.08.29	22:09	03:19	08:27	03:53	32.8	189.7	133.8	20:29	-18.7	93.6	134.3
2010.08.30	22:06	03:16	08:22	03:54	32.4	191.0	134.5	20:27	-18.5	94.0	135.0
2010.08.31	22:03	03:12	08:18	03:55	32.0	192.4	135.2	20:25	-18.4	94.5	135.7
2010.09.01	22:00	03:09	08:14	03:57	31.6	193.7	135.9	20:23	-18.2	94.9	136.4
2010.09.02	21:58	03:05	08:09	03:58	31.1	195.0	136.6	20:21	-18.0	95.3	137.0
2010.09.03	21:55	03:01	08:05	04:00	30.7	196.4	137.3	20:19	-17.9	95.8	137.7
2010.09.04	21:52	02:58	08:00	04:01	30.2	197.7	138.0	20:17	-17.7	96.2	138.4
2010.09.05	21:49	02:54	07:56	04:02	29.7	199.0	138.7	20:15	-17.4	96.7	139.1
2010.09.06	21:46	02:50	07:51	04:04	29.2	200.4	139.3	20:13	-17.2	97.1	139.8
2010.09.07	21:43	02:46	07:46	04:05	28.7	201.7	140.0	20:11	-17.0	97.6	140.5
2010.09.08	21:39	02:42	07:41	04:06	28.1	203.0	140.7	20:09	-16.8	98.1	141.2

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

Times of rising and setting of the comet for Rome (42°N, 12°E), in U.T.+1

yyyy mm dd.ddd q e per. nodo i G H  
103P/Hartley 2010 10 28.2781 1.422698 0.536334 195.6608 117.8251 12.0223 5.0 10.0

Date	Time	AR	Dec	R	D	Elong.	[mag]
		[h m s]	[° ' ]	[AU]	[AU]	[ ° ]	
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2010.09.22	00.00	23.39.26	+49°44'	1.171	0.239	129.7° E	9.0
2010.09.23	00.00	23.44.13	+50°21'	1.165	0.232	129.5° E	8.8
2010.09.24	00.00	23.49.25	+50°58'	1.159	0.226	129.3° E	8.7
2010.09.25	00.00	23.55.04	+51°35'	1.154	0.220	129.1° E	8.5
2010.09.26	00.00	00.01.14	+52°12'	1.149	0.213	128.9° E	8.4
2010.09.27	00.00	00.07.56	+52°48'	1.144	0.207	128.7° E	8.2
2010.09.28	00.00	00.15.15	+53°24'	1.139	0.201	128.5° E	8.0
2010.09.29	00.00	00.23.12	+53°58'	1.134	0.196	128.3° W	7.9
2010.09.30	00.00	00.31.53	+54°31'	1.129	0.190	128.1° W	7.7
2010.10.01	00.00	00.41.19	+55°03'	1.124	0.184	127.9° W	7.6
2010.10.02	00.00	00.51.35	+55°31'	1.120	0.179	127.8° W	7.4
2010.10.03	00.00	01.02.43	+55°57'	1.115	0.174	127.6° W	7.3
2010.10.04	00.00	01.14.45	+56°19'	1.111	0.169	127.4° W	7.1
2010.10.05	00.00	01.27.42	+56°36'	1.107	0.164	127.2° W	7.0
2010.10.06	00.00	01.41.35	+56°47'	1.103	0.159	127.1° W	6.8
2010.10.07	00.00	01.56.20	+56°51'	1.099	0.154	126.9° W	6.7
2010.10.08	00.00	02.11.55	+56°47'	1.096	0.150	126.7° W	6.6
2010.10.09	00.00	02.28.11	+56°33'	1.092	0.146	126.5° W	6.4
2010.10.10	00.00	02.45.02	+56°10'	1.089	0.142	126.2° W	6.3
2010.10.11	00.00	03.02.15	+55°35'	1.086	0.139	126.0° W	6.2
2010.10.12	00.00	03.19.37	+54°47'	1.083	0.135	125.7° W	6.1
2010.10.13	00.00	03.36.56	+53°47'	1.080	0.132	125.4° W	6.0
2010.10.14	00.00	03.53.59	+52°34'	1.077	0.130	125.1° W	5.9
2010.10.15	00.00	04.10.33	+51°07'	1.075	0.127	124.7° W	5.8
2010.10.16	00.00	04.26.30	+49°29'	1.072	0.125	124.3° W	5.7
2010.10.17	00.00	04.41.40	+47°39'	1.070	0.123	123.8° W	5.6
2010.10.18	00.00	04.55.59	+45°38'	1.068	0.122	123.3° W	5.6
2010.10.19	00.00	05.09.25	+43°28'	1.067	0.121	122.7° W	5.5
2010.10.20	00.00	05.21.55	+41°11'	1.065	0.121	122.1° W	5.5
2010.10.21	00.00	05.33.31	+38°48'	1.064	0.121	121.5° W	5.4
2010.10.22	00.00	05.44.14	+36°21'	1.062	0.121	120.8° W	5.4
2010.10.23	00.00	05.54.07	+33°52'	1.061	0.122	120.1° W	5.4
2010.10.24	00.00	06.03.13	+31°21'	1.060	0.123	119.4° W	5.4
2010.10.25	00.00	06.11.35	+28°52'	1.060	0.124	118.7° W	5.4
2010.10.26	00.00	06.19.16	+26°24'	1.059	0.126	118.1° W	5.4
2010.10.27	00.00	06.26.19	+23°59'	1.059	0.128	117.4° W	5.5
2010.10.28	00.00	06.32.48	+21°38'	1.059	0.130	116.8° W	5.5
2010.10.29	00.00	06.38.46	+19°22'	1.059	0.133	116.2° W	5.6
2010.10.30	00.00	06.44.15	+17°10'	1.059	0.136	115.7° W	5.6
2010.10.31	00.00	06.49.17	+15°04'	1.059	0.139	115.2° W	5.7
2010.11.01	00.00	06.53.55	+13°04'	1.060	0.142	114.7° W	5.7
2010.11.02	00.00	06.58.12	+11°09'	1.061	0.146	114.3° W	5.8
2010.11.03	00.00	07.02.08	+09°20'	1.062	0.149	114.0° W	5.9
2010.11.04	00.00	07.05.45	+07°36'	1.063	0.153	113.7° W	6.0
2010.11.05	00.00	07.09.05	+05°58'	1.064	0.157	113.4° W	6.0
2010.11.06	00.00	07.12.10	+04°25'	1.066	0.162	113.2° W	6.1
2010.11.07	00.00	07.15.00	+02°57'	1.067	0.166	113.1° W	6.2
2010.11.08	00.00	07.17.37	+01°34'	1.069	0.170	113.0° W	6.3
2010.11.09	00.00	07.20.01	+00°16'	1.071	0.175	113.0° W	6.4
2010.11.10	00.00	07.22.14	-00°58'	1.073	0.180	113.0° W	6.5
2010.11.11	00.00	07.24.15	-02°08'	1.076	0.184	113.0° W	6.6
2010.11.12	00.00	07.26.07	-03°15'	1.078	0.189	113.1° W	6.7
2010.11.13	00.00	07.27.49	-04°17'	1.081	0.194	113.2° W	6.8
2010.11.14	00.00	07.29.22	-05°16'	1.084	0.199	113.4° W	6.9
2010.11.15	00.00	07.30.47	-06°12'	1.087	0.204	113.6° W	7.1
2010.11.16	00.00	07.32.04	-07°04'	1.090	0.209	113.8° W	7.2
2010.11.17	00.00	07.33.13	-07°54'	1.093	0.214	114.0° W	7.3
2010.11.18	00.00	07.34.16	-08°41'	1.097	0.219	114.3° W	7.4
2010.11.19	00.00	07.35.11	-09°25'	1.101	0.224	114.6° W	7.5
2010.11.20	00.00	07.36.01	-10°07'	1.104	0.229	115.0° W	7.7
2010.11.21	00.00	07.36.44	-10°46'	1.108	0.234	115.3° W	7.8
2010.11.22	00.00	07.37.21	-11°24'	1.113	0.239	115.7° W	7.9
2010.11.23	00.00	07.37.53	-11°59'	1.117	0.244	116.1° W	8.0
2010.11.24	00.00	07.38.19	-12°32'	1.121	0.249	116.5° W	8.2
2010.11.25	00.00	07.38.41	-13°03'	1.126	0.255	117.0° W	8.3
2010.11.26	00.00	07.38.57	-13°32'	1.131	0.260	117.5° W	8.4
2010.11.27	00.00	07.39.09	-14°00'	1.135	0.265	117.9° W	8.6
2010.11.28	00.00	07.39.17	-14°25'	1.140	0.270	118.4° W	8.7
2010.11.29	00.00	07.39.20	-14°50'	1.145	0.275	119.0° W	8.8
2010.11.30	00.00	07.39.19	-15°12'	1.151	0.281	119.5° W	9.0

Date = data nel formato gg/mm/aaaa  
R = distanza dal Sole in U.A.  
Elong. = elongazione dal Sole in °

A.R. e DEC. = coordinate per Roma (42°N, 12°E)  
D = distanza dalla Terra in U.A.  
Mag = magnitudine

Date	Object			Morning twilight				-18°	Evening twilight			
	Rise	Transit	Set	Time	Alt	Az	Elong		Time	Alt	Az	Elon
-----	-----	-----	-----	-----	-----	-----	-----		-----	-----	-----	-----
2010.09.22	--:--	23:47	--:--	04:24	42.9	304.6	129.7		19:42	47.9	56.8	129.5
2010.09.23	--:--	23:49	--:--	04:25	43.0	305.4	129.4		19:40	47.5	55.7	129.3
2010.09.24	--:--	23:50	--:--	04:26	43.2	306.2	129.2		19:38	47.1	54.7	129.1
2010.09.25	--:--	23:53	--:--	04:27	43.5	307.0	129.0		19:36	46.7	53.6	128.9
2010.09.26	--:--	23:55	--:--	04:28	43.9	307.8	128.8		19:34	46.1	52.5	128.7
2010.09.27	--:--	23:59	--:--	04:30	44.3	308.5	128.6		19:33	45.5	51.4	128.5
2010.09.28	--:--	--:--	--:--	04:31	44.7	309.2	128.4		19:31	44.8	50.3	128.3
2010.09.29	--:--	00:03	--:--	04:32	45.3	309.8	128.3		19:29	44.1	49.3	128.1
2010.09.30	--:--	00:08	--:--	04:33	46.0	310.4	128.1		19:27	43.2	48.2	128.0
2010.10.01	--:--	00:13	--:--	04:34	46.7	311.0	127.9		19:25	42.2	47.2	127.8
2010.10.02	--:--	00:19	--:--	04:35	47.5	311.4	127.7		19:24	41.2	46.1	127.6
2010.10.03	--:--	00:27	--:--	04:36	48.5	311.9	127.5		19:22	40.0	45.1	127.4
2010.10.04	--:--	00:35	--:--	04:37	49.5	312.2	127.4		19:20	38.7	44.1	127.3
2010.10.05	--:--	00:44	--:--	04:39	50.6	312.5	127.2		19:18	37.3	43.2	127.1
2010.10.06	--:--	00:54	--:--	04:40	51.8	312.7	127.0		19:17	35.8	42.3	126.9
2010.10.07	--:--	01:05	--:--	04:41	53.2	312.7	126.8		19:15	34.1	41.4	126.7
2010.10.08	--:--	01:17	--:--	04:42	54.7	312.6	126.6		19:13	32.3	40.6	126.5
2010.10.09	--:--	01:29	--:--	04:43	56.2	312.4	126.4		19:12	30.4	39.8	126.3
2010.10.10	--:--	01:42	--:--	04:44	57.9	311.9	126.2		19:10	28.4	39.0	126.1
2010.10.11	--:--	01:56	--:--	04:45	59.7	311.1	126.0		19:08	26.2	38.3	125.8
2010.10.12	--:--	02:09	--:--	04:46	61.6	310.1	125.7		19:07	23.9	37.7	125.5
2010.10.13	--:--	02:23	--:--	04:47	63.6	308.6	125.4		19:05	21.5	37.1	125.2
2010.10.14	--:--	02:36	--:--	04:49	65.6	306.5	125.0		19:04	18.9	36.6	124.8
2010.10.15	--:--	02:49	--:--	04:50	67.6	303.8	124.6		19:02	16.3	36.1	124.4
2010.10.16	--:--	03:01	--:--	04:51	69.6	300.2	124.2		19:00	13.5	35.7	123.9
2010.10.17	16:24	03:12	14:15	04:52	71.6	295.4	123.7		18:59	10.7	35.4	123.4
2010.10.18	17:17	03:22	13:42	04:53	73.4	289.2	123.2		18:57	7.8	35.1	122.8
2010.10.19	17:57	03:31	13:20	04:54	74.9	281.2	122.6		18:56	4.9	34.9	122.2
2010.10.20	18:29	03:40	13:04	04:55	75.9	271.4	122.0		18:55	1.9	34.8	121.6
2010.10.21	18:57	03:47	12:50	04:56	76.5	260.3	121.3		18:53	-1.0	34.7	120.9
2010.10.22	19:22	03:54	12:37	04:57	76.4	248.8	120.7		18:52	-3.9	34.7	120.3
2010.10.23	19:44	04:00	12:26	04:58	75.7	238.1	120.0		18:50	-6.8	34.7	119.6
2010.10.24	20:03	04:05	12:16	04:59	74.5	228.9	119.3		18:49	-9.6	34.9	118.9
2010.10.25	20:20	04:09	12:07	05:01	72.9	221.5	118.6		18:48	-12.3	35.1	118.2
2010.10.26	20:36	04:13	11:58	05:02	71.1	215.8	117.9		18:46	-14.9	35.3	117.6
2010.10.27	20:49	04:16	11:49	05:03	69.2	211.5	117.3		18:45	-17.4	35.7	116.9
2010.10.28	21:02	04:18	11:41	05:04	67.2	208.2	116.7		18:44	-19.8	36.0	116.3
2010.10.29	21:13	04:20	11:33	05:05	65.1	205.7	116.1		18:43	-22.1	36.5	115.8
2010.10.30	21:22	04:22	11:26	05:06	63.1	203.9	115.5		18:41	-24.3	37.0	115.3
2010.10.31	21:31	04:23	11:19	05:07	61.1	202.6	115.1		18:40	-26.3	37.6	114.8
2010.11.01	21:39	04:23	11:11	05:08	59.2	201.6	114.6		18:39	-28.1	38.3	114.4
2010.11.02	21:46	04:24	11:05	05:09	57.3	201.0	114.2		18:38	-29.9	39.0	114.0
2010.11.03	21:52	04:24	10:58	05:10	55.5	200.6	113.9		18:37	-31.5	39.7	113.7
2010.11.04	21:58	04:23	10:51	05:11	53.8	200.4	113.6		18:36	-33.1	40.5	113.5
2010.11.05	22:02	04:23	10:45	05:12	52.1	200.4	113.4		18:35	-34.4	41.4	113.3
2010.11.06	22:07	04:22	10:38	05:13	50.5	200.6	113.2		18:34	-35.7	42.3	113.1
2010.11.07	22:10	04:21	10:32	05:15	48.9	200.8	113.1		18:33	-36.9	43.3	113.0
2010.11.08	22:14	04:19	10:26	05:16	47.5	201.1	113.0		18:32	-38.0	44.3	113.0
2010.11.09	22:16	04:18	10:19	05:17	46.0	201.6	113.0		18:31	-38.9	45.3	113.0
2010.11.10	22:19	04:16	10:13	05:18	44.7	202.0	113.0		18:30	-39.8	46.4	113.0
2010.11.11	22:21	04:14	10:07	05:19	43.3	202.6	113.0		18:29	-40.6	47.5	113.1
2010.11.12	22:22	04:12	10:01	05:20	42.1	203.2	113.1		18:28	-41.2	48.7	113.2
2010.11.13	22:23	04:10	09:55	05:21	40.8	203.8	113.2		18:28	-41.8	49.9	113.3
2010.11.14	22:24	04:07	09:49	05:22	39.7	204.5	113.4		18:27	-42.4	51.1	113.5
2010.11.15	22:25	04:05	09:44	05:23	38.5	205.3	113.6		18:26	-42.8	52.3	113.7
2010.11.16	22:25	04:02	09:38	05:24	37.4	206.0	113.8		18:26	-43.2	53.6	114.0
2010.11.17	22:25	03:59	09:32	05:25	36.3	206.8	114.1		18:25	-43.5	54.8	114.2
2010.11.18	22:25	03:56	09:26	05:26	35.2	207.6	114.4		18:24	-43.7	56.1	114.5
2010.11.19	22:24	03:53	09:20	05:27	34.2	208.4	114.7		18:24	-43.8	57.4	114.9
2010.11.20	22:23	03:50	09:15	05:28	33.2	209.3	115.0		18:23	-43.9	58.7	115.2
2010.11.21	22:22	03:47	09:09	05:29	32.2	210.1	115.4		18:23	-44.0	59.9	115.6
2010.11.22	22:21	03:44	09:04	05:30	31.2	211.0	115.8		18:22	-43.9	61.2	116.0
2010.11.23	22:20	03:40	08:58	05:31	30.2	211.9	116.2		18:22	-43.9	62.5	116.4
2010.11.24	22:18	03:37	08:52	05:32	29.3	212.8	116.6		18:21	-43.7	63.8	116.9
2010.11.25	22:17	03:33	08:47	05:33	28.4	213.7	117.1		18:21	-43.5	65.1	117.3
2010.11.26	22:15	03:29	08:41	05:34	27.4	214.6	117.6		18:20	-43.3	66.3	117.8
2010.11.27	22:12	03:26	08:36	05:35	26.5	215.6	118.1		18:20	-43.0	67.5	118.3
2010.11.28	22:10	03:22	08:30	05:36	25.6	216.5	118.6		18:20	-42.7	68.8	118.8
2010.11.29	22:08	03:18	08:25	05:37	24.7	217.5	119.1		18:20	-42.3	70.0	119.4
2010.11.30	22:05	03:14	08:19	05:38	23.8	218.4	119.6		18:19	-41.9	71.2	119.9

Tempi di levata e tramonto in T.U.+1, calcolati per Roma (42°N, 12°E), aggiungere un'ora quando si adotta l'ora legale

Times of rising and setting of the comet for Rome (42°N, 12°E), in U.T.+1

NB: TUTTI I DATI RELATIVI ALLE COMETE (PARAMETRI ORBITALI E MAGNITUDINE) SONO ALTAMENTE SOGGETTI A VARIAZIONI NEL TEMPO!

# CONGIUNZIONI <5° PIANETI - COMETE m<9

## CONJUNCTIONS <5° PLANETS - COMETS m<9

Date TT Dm Dl r1 r2 p e m1 m2 tm(s)

Questo anno non avvengono fenomeni - No phenomena this year

# CONGIUNZIONI MULTIPLE PIANETI - COMETE

## (eventi con 2 o più pianeti ed una cometa entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS - COMETS

### (events with 2 or more planets and 1 comet within 5°)

Data TT Dmed Dmax emin m2d mmax

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi  
 Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi  
 R1 = distanza in U.A. del pianeta dalla Terra  
 R2 = distanza in U.A. della cometa dalla Terra  
 p = angolo di posizione tra i corpi, in gradi  
 e = elongazione, in gradi  
 m1 = magnitudine del pianeta  
 m2 = magnitudine della cometa  
 tm = se presente, uno dei due corpi viene occultato massimo per x secondi

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi  
 Dmax = diametro del cerchio comprendente gli oggetti, in gradi  
 emin = elongazione minima, in gradi  
 m2d = magnitudine del penultimo corpo più debole  
 mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dm = least distance between the centers of the bodies  
 Dl = parameter limit, if  $Dm < Dl$  there is an occultation between the bodies  
 R1 = distance in A.U. of planet from the Earth  
 R2 = distance in A.U. of comet from the Earth  
 P = angle of position between the bodies, in °  
 e = elongation, in degree  
 m1 = magnitude of the planet  
 m2 = magnitude of the comet  
 tm = if present, an object is occulted maximum for x seconds

Dmed = middle distance between the centers of the bodies, in °  
 Dmax = diameter of the group, in °  
 emin = least elongation, in °  
 m2d = magnitude of the 2nd brightest object  
 mmax = least magnitude

# CONGIUNZIONI <5° TRA COMETE m<9 CONJUNCTIONS <5° BETWEEN COMETS m<9

Data	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)
------	----	----	----	----	----	---	---	----	----	-------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi

R1 = distanza in U.A. del primo corpo dalla Terra

R2 = distanza in U.A. del secondo dalla Terra

p = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine del primo corpo

m2 = magnitudine del secondo corpo

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if  $Dm < Dl$  there is an occultation between the bodies

R1 = distance in A.U. of body 1 from the Earth

R2 = distance in A.U. of body 2 from the Earth

P = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the first body

m2 = magnitude of the second body

tm = if present, an object is occulted maximum for x seconds

# CONGIUNZIONI <1° LUNA - COMETE m<9

## CONJUNCTIONS <1° MOON - COMETS m<9

### Geocentriche - Geocentric

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)
------	----	----	----	----	----	---	---	----	----	-------

Questo anno non avvengono fenomeni - No phenomena this year

### Topocentriche - Topocentric 42°N - 12°E

Date	TT	Dm	Alt	r1	r2	p	e	m1	m2	tm(s)
------	----	----	-----	----	----	---	---	----	----	-------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi

Alt = altezza sull'orizzonte della cometa, in gradi

R1 = distanza in U.A. della cometa dalla Terra

R2 = distanza in U.A. della Luna dalla Terra

p = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della cometa

m2 = magnitudine della Luna

tm = se presente, la cometa viene occultata massimo per x secondi

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if  $Dm < Dl$  there is an occultation between the bodies

Alt = height in ° on the horizon of the comet, in °

R1 = distance in A.U. of the comet from the Earth

R2 = distance in A.U. of the Moon from the Earth

p = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the comet

m2 = magnitude of the Moon

tm = if present, the comet is occulted maximum for x seconds

# CONGIUNZIONI MULTIPLE PIANETI-LUNA-COMETE

(eventi con 1 o più pianeti, la Luna ed una cometa entro 5°)

# MULTIPLE CONJUNCTIONS PLANETS-MOON-COMETES

(events with 1 or more planets, the Moon and 1 comet within 5°)

## Geocentriche - Geocentric

Date	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

## Topocentriche - Topocentric 42°N - 12°E

Date	UT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# CONGIUNZIONI <1° ASTEROIDI m<9 - COMETE m<9

## CONJUNCTIONS <1° ASTEROIDS m<9 - COMETS m<9

Date TT Dm Dl r1 r2 p e m1 m2 tm(s)

Questo anno non avvengono fenomeni - No phenomena this year

# CONGIUNZIONI MULTIPLE ASTEROIDI m<9 -COMETE m<9

(eventi con 2 comete ed un asteroide o viceversa entro 5°)

## MULTIPLE CONJUNCTIONS ASTEROIDS m<9 -COMETS m<9

(events with 2 comets and 1 asteroid or viceversa within 5°)

Data TT Dmed Dmax emin m2d mmax

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi

R1 = distanza in U.A. dell'asteroide dalla Terra

R2 = distanza in U.A. della cometa dalla Terra

p = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine dell'asteroide

m2 = magnitudine della cometa

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if  $Dm < Dl$  there is an occultation between the bodies

R1 = distance in A.U. of the asteroid from the Earth

R2 = distance in A.U. of the comet from the Earth

p = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the asteroid

m2 = magnitude of the comet

tm = if present, an object is occulted maximum for x seconds

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

**CONGIUNZ. MULTIPLE PIANETI-COMETE-ASTEROIDI**  
(eventi con 1 pianeta, una cometa ed un asteroide entro 5°)  
**MULTIPLE CONJUNCT. PLANETS-COMETS-ASTEROIDS**  
(events with 1 planet, 1 comet and 1 asteroid within 5°)

Data            TT            Dmed    Dmax    emin    m2d    mmax

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# CONGIUNZIONI <5° COMETE m<9 - STELLE m<2 CONJUNCTIONS <5° COMETS m<9 - STARS m<2

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)			
2010/08/10 09:41:29		2.23319	0.01133	1.272	29	12	9.8	1.4		2P	Alpha	LEO Regulus
2010/10/12 19:02:12		4.31483	0.10842	0.133	201	-125	7.8	1.8		103P	Alpha	PER Mirfak
2010/10/18 15:53:25		2.77457	0.11821	0.122	44	-123	7.5	0.3		103P	Alpha	AUR Capella

# CONGIUNZIONI <5° COMETE m<9-OGGETTI MESSIER m<9 CONJUNCTIONS <5° COMETS m<9-MESSIER OBJECTS m<9

Date	TT	Dm	Dl	r1	p	e	m1	m*	tm(s)
------	----	----	----	----	---	---	----	----	-------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se Dm<Dl vi è una occultazione tra i corpi

R1 = distanza in U.A. della cometa dalla Terra

p = angolo di posizione tra i corpi, in gradi

e = elongazione, in gradi

m1 = magnitudine della cometa

m\* = magnitudine del secondo corpo

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if Dm < Dl there is an occultation between the bodies

R1 = distance in A.U. of the comet from the Earth

p = angle of position between the bodies, in °

e = elongation, in degree

m1 = magnitude of the comet

m\* = magnitude of the second body

tm = if present, an object is occulted maximum for x seconds

## CONGIUNZIONI MULTIPLE PIANETI-COMETE-STELLE

(eventi con 1 pianeta, 1 cometa ed 1 stella di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS-COMETS-STARS

(events with 1 planet, 1 comet and 1 star with mag<2 within 5°)

Data TT Dmed Dmax emin m2d mmax

Questo anno non avvengono fenomeni - No phenomena this year

## CONGIUNZIONI MULTIPLE PIANETI-COMETE-OGGETTI

(eventi con 1 pianeta, 1 cometa ed un oggetto di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS PLANETS-COMET-OBJECTS

(events with 1 planet, 1 comet and 1 object with mag<2 within 5°)

Data TT Dmed Dmax emin m2d mmax

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# CONGIUNZIONI MULTIPLE LUNA-COMETE-STELLE

(eventi con la Luna, 1 cometa ed 1 stella di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS MOON-COMETS-STARs

(events with the Moon, 1 comet and 1 star with mag<2 within 5°)

### Geocentriche - Geocentric

Date	TT	Dmed	Dmax	emin	m2d	mmax				
2010/08/10	23:18:18	3.171	4.357	13	1.4	9.9	Moon	Alpha	LEO	Regulus 2P

### Topocentriche - Topocentric 42°N - 12°E

Date	UT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# CONGIUNZIONI MULTIPLE LUNA-COMETE-OGGETTI

(eventi con la Luna, 1 cometa ed un oggetto di mag<2 entro 5°)

## MULTIPLE CONJUNCTIONS MOON-COMETES-OBJECTS

(events with the Moon, 1 comet and 1 object with mag<2 within 5°)

### Geocentriche - Geocentric

Date	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

### Topocentriche - Topocentric 42°N - 12°E

Date	UT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

# CONGIUNZIONI MULTIPLE

## STELLE - COMETE - ASTEROIDI

(eventi con 1 stella di mag<2, 1 cometa ed un asteroide mag<9 entro 5°)

## MULTIPLE CONJUNCTIONS

## STARS - COMETS - ASTEROIDS

(events with 1 star with mag<2, 1 comet and 1 asteroid with mag<9 within 5°)

Data	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# CONGIUNZIONI MULTIPLE

## OGGETTI - COMETE - ASTEROIDI

(eventi con un oggetto di mag<2, 1 cometa ed un asteroide mag<9 entro 5°)

# MULTIPLE CONJUNCTIONS

## OBJECTS - COMETS - ASTEROIDS

(events with 1 object with mag<2, 1 comet and 1 asteroid with mag<9 within 5°)

Data	TT	Dmed	Dmax	emin	m2d	mmax
------	----	------	------	------	-----	------

Questo anno non avvengono fenomeni - No phenomena this year

Data nel formato anno/mese/giorno

Dmed = distanza media in gradi tra i centri degli oggetti, in gradi

Dmax = diametro del cerchio comprendente gli oggetti, in gradi

emin = elongazione minima, in gradi

m2d = magnitudine del penultimo corpo più debole

mmax = magnitudine del corpo più debole

Date in the format year/month/day

Dmed = middle distance between the centers of the bodies, in °

Dmax = diameter of the group, in °

emin = least elongation, in °

m2d = magnitude of the 2nd brightest object

mmax = least magnitude

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# ECLIPSE DI SOLE E DI LUNA SOLAR AND LUNAR ECLIPSES

## Annular Solar Eclipse of 2010 Jan 15

Geocentric Conjunction = 07:20:19.8 UT      J.D. = 2455211.805785  
Greatest Eclipse = 07:06:31.5 UT      J.D. = 2455211.796198

Eclipse Magnitude = 0.9190      Gamma = 0.4003

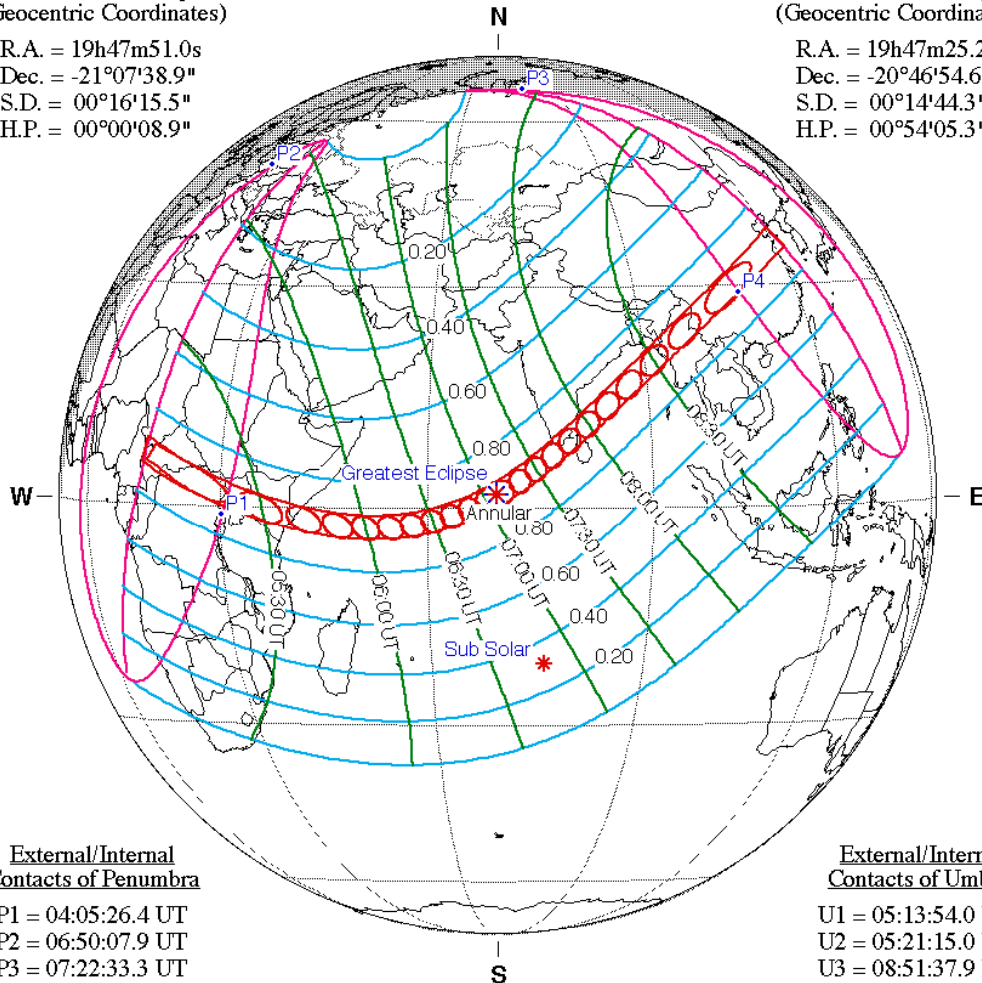
Saros Series = 141      Member = 23 of 70

### Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 19h47m51.0s  
Dec. = -21°07'38.9"  
S.D. = 00°16'15.5"  
H.P. = 00°00'08.9"

### Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 19h47m25.2s  
Dec. = -20°46'54.6"  
S.D. = 00°14'44.3"  
H.P. = 00°54'05.3"



### External/Internal Contacts of Penumra

P1 = 04:05:26.4 UT  
P2 = 06:50:07.9 UT  
P3 = 07:22:33.3 UT  
P4 = 10:07:32.8 UT

### External/Internal Contacts of Umbra

U1 = 05:13:54.0 UT  
U2 = 05:21:15.0 UT  
U3 = 08:51:37.9 UT  
U4 = 08:59:01.4 UT

### Local Circumstances at Greatest Eclipse

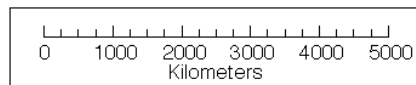
Lat. = 01°38.0'N      Sun Alt. = 66.4°  
Long. = 069°18.0'E      Sun Azm. = 164.9°  
Path Width = 333.2 km      Duration = 11m07.8s

### Ephemeris & Constants

Eph. = Newcomb/ILE  
 $\Delta T = 66.6$  s  
k1 = 0.2724880  
k2 = 0.2722810  
 $\Delta b = 0.0''$      $\Delta l = 0.0''$

### Geocentric Libration (Optical + Physical)

l = 1.48°  
b = -0.48°  
c = -8.81°  
Brown Lun. No. = 1077



F. Espenak, NASA's GSFC - Fri, Jul 2,  
[sunearth.gsfc.nasa.gov/eclipse/eclipse.html](http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html)



**PATH OF THE ANTUMBRAL SHADOW  
ANNULAR SOLAR ECLIPSE OF 2010 JANUARY 15**

ΔT = 66.0 s

Universal Time	Northern Limit		Southern Limit		Central Line		Sun Alt °	Path Width km	Central Durat. s
	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude			
Limits	08°37.1'N	016°04.1'E	05°21.4'N	015°12.2'E	06°58.7'N	015°38.6'E	0	371	07m09.4s
05:20	05°36.1'N	023°55.2'E	01°10.3'N	026°38.3'E	03°16.3'N	025°32.1'E	11	360	07m41.3s
05:25	02°54.0'N	031°38.9'E	00°51.6'S	032°56.7'E	00°58.9'N	032°22.3'E	19	354	08m09.8s
05:30	01°29.3'N	036°16.1'E	02°03.8'S	037°14.5'E	00°18.8'S	036°48.0'E	25	351	08m31.7s
05:35	00°33.2'N	039°47.9'E	02°52.9'S	040°39.0'E	01°11.1'S	040°15.3'E	30	349	08m50.8s
05:40	00°06.2'S	042°43.2'E	03°27.5'S	043°31.7'E	01°48.0'S	043°08.9'E	34	347	09m08.1s
05:45	00°34.2'S	045°14.8'E	03°51.7'S	046°02.8'E	02°14.0'S	045°39.9'E	37	347	09m24.0s
05:50	00°53.5'S	047°29.2'E	04°07.8'S	048°18.0'E	02°31.6'S	047°54.5'E	41	346	09m38.7s
05:55	01°05.8'S	049°30.6'E	04°17.4'S	050°21.0'E	02°42.5'S	049°56.6'E	44	346	09m52.3s
06:00	01°12.4'S	051°21.8'E	04°21.4'S	052°14.2'E	02°47.8'S	051°48.6'E	47	346	10m04.9s
06:05	01°14.0'S	053°04.7'E	04°20.6'S	053°59.4'E	02°48.2'S	053°32.5'E	49	346	10m16.4s
06:10	01°11.3'S	054°40.7'E	04°15.5'S	055°37.9'E	02°44.2'S	055°09.7'E	52	345	10m26.9s
06:15	01°04.6'S	056°11.0'E	04°06.6'S	057°10.8'E	02°36.4'S	056°41.2'E	54	345	10m36.3s
06:20	00°54.4'S	057°36.4'E	03°54.1'S	058°38.8'E	02°25.1'S	058°07.9'E	56	345	10m44.5s
06:25	00°40.9'S	058°57.6'E	03°38.4'S	060°02.7'E	02°10.5'S	059°30.4'E	58	344	10m51.7s
06:30	00°24.4'S	060°15.3'E	03°19.6'S	061°23.0'E	01°52.8'S	060°49.3'E	60	344	10m57.7s
06:35	00°04.9'S	061°30.0'E	02°58.0'S	062°40.2'E	01°32.3'S	062°05.2'E	61	343	11m02.5s
06:40	00°17.3'N	062°42.0'E	02°33.6'S	063°54.7'E	01°09.0'S	063°18.4'E	63	341	11m06.2s
06:45	00°42.2'N	063°51.8'E	02°06.6'S	065°06.9'E	00°43.1'S	064°29.4'E	64	340	11m08.8s
06:50	01°09.6'N	064°59.8'E	01°37.0'S	066°17.2'E	00°14.6'S	065°38.4'E	65	339	11m10.3s
06:55	01°39.6'N	066°06.2'E	01°04.9'S	067°25.8'E	00°16.4'N	066°45.9'E	66	337	11m10.8s
07:00	02°12.0'N	067°11.4'E	00°30.5'S	068°33.0'E	00°49.9'N	067°52.1'E	66	335	11m10.1s
07:05	02°47.0'N	068°15.7'E	00°06.4'N	069°39.2'E	01°25.8'N	068°57.3'E	66	334	11m08.5s
07:10	03°24.4'N	069°19.4'E	00°45.6'N	070°44.6'E	02°04.1'N	070°01.9'E	66	332	11m06.0s
07:15	04°04.3'N	070°22.7'E	01°27.2'N	071°49.6'E	02°44.9'N	071°06.0'E	66	330	11m02.5s
07:20	04°46.7'N	071°25.9'E	02°11.2'N	072°54.4'E	03°28.1'N	072°10.0'E	65	329	10m58.2s
07:25	05°31.7'N	072°29.5'E	02°57.7'N	073°59.3'E	04°13.8'N	073°14.2'E	65	327	10m53.2s
07:30	06°19.4'N	073°33.6'E	03°46.6'N	075°04.7'E	05°02.1'N	074°18.9'E	63	326	10m47.4s
07:35	07°09.9'N	074°38.6'E	04°38.1'N	076°10.9'E	05°53.1'N	075°24.5'E	62	325	10m40.9s
07:40	08°03.2'N	075°45.0'E	05°32.3'N	077°18.3'E	06°46.9'N	076°31.4'E	61	324	10m33.8s
07:45	08°59.6'N	076°53.2'E	06°29.2'N	078°27.3'E	07°43.5'N	077°40.0'E	59	323	10m26.1s
07:50	09°59.3'N	078°03.6'E	07°29.2'N	079°38.4'E	08°43.3'N	078°50.7'E	57	323	10m17.8s
07:55	11°02.4'N	079°17.0'E	08°32.3'N	080°52.2'E	09°46.4'N	080°04.3'E	55	323	10m09.1s
08:00	12°09.3'N	080°33.9'E	09°38.9'N	082°09.4'E	10°53.2'N	081°21.3'E	53	323	09m59.9s
08:05	13°20.4'N	081°55.2'E	10°49.3'N	083°30.8'E	12°03.9'N	082°42.6'E	51	324	09m50.2s
08:10	14°36.2'N	083°22.0'E	12°03.9'N	084°57.4'E	13°19.1'N	084°09.3'E	48	325	09m40.1s
08:15	15°57.4'N	084°55.7'E	13°23.2'N	086°30.4'E	14°39.3'N	085°42.6'E	45	326	09m29.5s
08:20	17°24.7'N	086°38.2'E	14°48.1'N	088°11.6'E	16°05.3'N	087°24.3'E	43	327	09m18.4s
08:25	18°59.4'N	088°31.9'E	16°19.5'N	090°03.3'E	17°38.3'N	089°16.9'E	39	329	09m06.7s
08:30	20°43.2'N	090°40.6'E	17°58.9'N	092°08.6'E	19°19.7'N	091°23.7'E	36	332	08m54.5s
08:35	22°38.9'N	093°10.1'E	19°48.4'N	094°32.7'E	21°12.1'N	093°50.2'E	32	335	08m41.4s
08:40	24°50.8'N	096°10.2'E	21°51.7'N	097°23.6'E	23°19.4'N	096°45.2'E	28	339	08m27.3s
08:45	27°28.1'N	100°00.9'E	24°15.2'N	100°56.9'E	25°49.1'N	100°26.1'E	23	344	08m11.5s
08:50	30°54.8'N	105°37.0'E	27°14.3'N	105°49.4'E	29°00.1'N	105°36.9'E	17	351	07m52.7s
08:55	-	-	31°58.7'N	114°52.1'E	34°49.6'N	116°59.7'E	4	367	07m21.4s
Limits	38°24.0'N	120°53.7'E	35°16.0'N	122°26.7'E	36°49.6'N	121°40.9'E	0	373	07m11.5s

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center

**PHYSICAL EPHEMERIS OF THE ANTUMBRAL SHADOW  
ANNULAR SOLAR ECLIPSE OF 2010 JANUARY 15**

											$\Delta T = 66.0 \text{ s}$
Universal Time	Central Line		Diameter Ratio	Eclipse Obsecr.	Sun Alt °	Sun Azm °	Path Width km	Major Axis km	Minor Axis km	Unbra Veloc. km/s	Central Durat.
05:17.6	06°58.7'N	015°38.6'E	0.9061	0.8210	0.0	111.3	370.7	-	361.0	-	07m09.4s
05:20	03°16.3'N	025°32.1'E	0.9088	0.8260	11.1	112.3	360.4	1817.1	349.5	3.820	07m41.3s
05:25	00°58.9'N	032°22.3'E	0.9108	0.8296	19.4	112.9	354.2	1025.7	341.1	2.017	08m09.8s
05:30	00°18.8'S	036°48.0'E	0.9121	0.8320	25.2	113.3	350.8	789.6	335.6	1.476	08m31.7s
05:35	01°11.1'S	040°15.3'E	0.9132	0.8339	29.8	113.8	348.8	666.5	331.3	1.193	08m50.8s
05:40	01°48.0'S	043°08.9'E	0.9140	0.8354	33.8	114.4	347.4	588.6	327.8	1.013	09m08.1s
05:45	02°14.0'S	045°39.9'E	0.9147	0.8367	37.4	115.1	346.6	534.2	324.8	0.888	09m24.0s
05:50	02°31.6'S	047°54.5'E	0.9154	0.8379	40.7	116.0	346.1	493.9	322.2	0.794	09m38.7s
05:55	02°42.5'S	049°56.6'E	0.9159	0.8389	43.7	117.0	345.8	462.7	319.9	0.723	09m52.3s
06:00	02°47.8'S	051°48.6'E	0.9164	0.8398	46.5	118.2	345.7	438.0	317.8	0.666	10m04.9s
06:05	02°48.2'S	053°32.5'E	0.9168	0.8406	49.1	119.7	345.6	417.9	316.1	0.620	10m16.4s
06:10	02°44.2'S	055°09.7'E	0.9172	0.8413	51.6	121.4	345.5	401.4	314.5	0.583	10m26.9s
06:15	02°36.4'S	056°41.2'E	0.9176	0.8419	53.9	123.3	345.2	387.8	313.1	0.553	10m36.3s
06:20	02°25.1'S	058°07.9'E	0.9178	0.8424	56.0	125.6	344.8	376.4	311.9	0.528	10m44.5s
06:25	02°10.5'S	059°30.4'E	0.9181	0.8429	57.9	128.2	344.3	366.8	310.8	0.508	10m51.7s
06:30	01°52.8'S	060°49.3'E	0.9183	0.8433	59.7	131.2	343.6	358.9	309.9	0.492	10m57.7s
06:35	01°32.3'S	062°05.2'E	0.9185	0.8437	61.3	134.6	342.6	352.4	309.1	0.480	11m02.5s
06:40	01°09.0'S	063°18.4'E	0.9187	0.8440	62.7	138.4	341.5	347.0	308.4	0.470	11m06.2s
06:45	00°43.1'S	064°29.4'E	0.9188	0.8442	63.9	142.7	340.2	342.7	307.9	0.464	11m08.8s
06:50	00°14.6'S	065°38.4'E	0.9189	0.8444	64.9	147.3	338.7	339.5	307.5	0.460	11m10.3s
06:55	00°16.4'N	066°45.9'E	0.9190	0.8445	65.7	152.4	337.1	337.1	307.2	0.458	11m10.8s
07:00	00°49.9'N	067°52.1'E	0.9190	0.8446	66.2	157.7	335.4	335.6	307.0	0.458	11m10.1s
07:05	01°25.8'N	068°57.3'E	0.9190	0.8446	66.4	163.2	333.7	335.0	307.0	0.461	11m08.5s
07:10	02°04.1'N	070°01.9'E	0.9190	0.8446	66.3	168.8	332.0	335.2	307.0	0.466	11m06.0s
07:15	02°44.9'N	071°06.0'E	0.9190	0.8445	66.0	174.3	330.3	336.2	307.2	0.472	11m02.5s
07:20	03°28.1'N	072°10.0'E	0.9189	0.8444	65.4	179.6	328.7	338.1	307.5	0.480	10m58.2s
07:25	04°13.8'N	073°14.2'E	0.9188	0.8442	64.6	184.7	327.3	340.9	307.9	0.491	10m53.2s
07:30	05°02.1'N	074°18.9'E	0.9187	0.8440	63.5	189.4	326.0	344.6	308.4	0.504	10m47.4s
07:35	05°53.1'N	075°24.5'E	0.9185	0.8437	62.2	193.7	324.9	349.4	309.1	0.519	10m40.9s
07:40	06°46.9'N	076°31.4'E	0.9183	0.8433	60.7	197.7	324.1	355.3	309.9	0.536	10m33.8s
07:45	07°43.5'N	077°40.0'E	0.9181	0.8429	59.0	201.3	323.4	362.4	310.8	0.556	10m26.1s
07:50	08°43.3'N	078°50.7'E	0.9179	0.8425	57.1	204.6	323.1	371.1	311.8	0.580	10m17.8s
07:55	09°46.4'N	080°04.3'E	0.9176	0.8419	55.1	207.6	323.0	381.4	313.0	0.607	10m09.1s
08:00	10°53.2'N	081°21.3'E	0.9172	0.8413	52.9	210.3	323.2	393.7	314.4	0.639	09m59.9s
08:05	12°03.9'N	082°42.6'E	0.9169	0.8406	50.6	212.8	323.7	408.6	315.9	0.676	09m50.2s
08:10	13°19.1'N	084°09.3'E	0.9164	0.8399	48.1	215.1	324.5	426.5	317.7	0.720	09m40.1s
08:15	14°39.3'N	085°42.6'E	0.9160	0.8390	45.4	217.3	325.7	448.4	319.6	0.773	09m29.5s
08:20	16°05.3'N	087°24.3'E	0.9155	0.8380	42.5	219.4	327.3	475.6	321.8	0.838	09m18.4s
08:25	17°38.3'N	089°16.9'E	0.9149	0.8370	39.4	221.4	329.3	510.2	324.3	0.919	09m06.7s
08:30	19°19.7'N	091°23.7'E	0.9142	0.8357	36.0	223.4	331.8	555.6	327.1	1.025	08m54.5s
08:35	21°12.1'N	093°50.2'E	0.9134	0.8343	32.2	225.4	334.9	618.1	330.4	1.170	08m41.4s
08:40	23°19.4'N	096°45.2'E	0.9125	0.8326	28.0	227.7	338.8	710.6	334.3	1.382	08m27.3s
08:45	25°49.1'N	100°26.1'E	0.9113	0.8305	23.0	230.2	343.8	866.2	339.0	1.738	08m11.5s
08:50	29°00.1'N	105°36.9'E	0.9098	0.8277	16.5	233.6	351.0	1209.8	345.4	2.519	07m52.7s
08:55	34°49.6'N	116°59.7'E	0.9068	0.8223	4.4	240.5	366.6	4618.8	358.0	10.219	07m21.4s
08:55.4	36°49.6'N	121°40.9'E	0.9058	0.8204	0.0	243.2	372.7	-	362.6	-	07m11.5s

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center

TABLE 2.7  
LOCAL CIRCUMSTANCES FOR AFRICA: ANGOLA TO LIBYA  
ANNUAL SOLAR ECLIPSE OF 2010 JANUARY 15

Location Name	Latitude	Longitude	Elev.	First Contact			Second Contact			Third Contact			Fourth Contact			Maximum Eclipse			Eclips. Mag.	Eclips. Obs.	Tabular Depth	Duration		
				h	m	s	h	m	s	h	m	s	h	m	s	h	m	s					U.T.	g
<b>ANGOLA</b>																								
Luanda	08°46'S	013°14'E	59	—	—	—	—	—	—	—	—	—	06:21:43.1	56	148	18	05:14:47.9	355	93	3	111	0.508	0.387	
<b>BENIN</b>																								
Cotonou	06°21'N	002°26'E	—	—	—	—	—	—	—	—	—	—	06:26:55.3	75	157	4	06:07	Rise	—	—	0	111	0.253	0.142
Porto-Novo	06°29'N	002°37'E	—	—	—	—	—	—	—	—	—	—	06:27:06.8	76	157	4	06:07	Rise	—	—	0	111	0.262	0.150
<b>BOTSWANA</b>																								
Gaborone	24°45'S	025°55'E	—	04:38:01.5	315	49	11	—	—	—	—	—	06:14:32.5	29	135	53	05:23:58.0	352	102	21	104	0.198	0.180	
<b>BURUNDI</b>																								
Bujumbura	03°23'S	029°22'E	—	04:05:49.7	273	0	0	—	—	—	—	—	06:53:40.7	72	149	39	05:23:02.1	353	80	17	111	0.012	0.732	
<b>CAMEROON</b>																								
Yaounde	04°03'N	009°42'E	—	—	—	—	—	—	—	—	—	—	06:29:46.1	76	157	12	05:34	Rise	—	—	0	111	0.068	0.565
	03°52'N	011°51'E	770	—	—	—	—	—	—	—	—	—	06:31:14.1	76	157	14	05:27	Rise	—	—	0	111	0.760	0.871
<b>CENTRAL AFRICAN REPUBLIC</b>																								
Bangui	04°22'N	018°35'E	387	—	—	—	05:15:09.1	321	45	05:19:10.4	28	113	06:39:30.5	81	156	23	05:17:30.1	354	78	4	112	0.987	0.823	
Bouar	05°07'N	015°36'E	—	—	—	—	05:14:13.0	300	24	05:20:01.2	49	132	06:36:47.3	82	156	19	05:17:07.0	354	78	4	111	0.906	0.821	
<b>CHAD</b>																								
Ndjamena	08°34'N	015°05'E	—	—	—	—	05:17:38.4	187	268	05:19:15.2	161	242	06:38:49.7	86	159	18	05:18:27.2	174	295	1	111	0.906	0.821	
Roundou	18°07'N	015°03'E	285	—	—	—	—	—	—	—	—	—	06:39:30.4	91	161	16	05:26	Rise	—	—	0	112	0.008	0.726
<b>CONGO</b>																								
Brazzaville	04°16'S	015°17'E	318	—	—	—	—	—	—	—	—	—	06:29:47.8	66	152	20	05:14:45.0	354	88	3	111	0.651	0.545	
Pointe-Noire	04°48'S	011°51'E	50	—	—	—	—	—	—	—	—	—	06:24:22.5	62	151	16	05:14:34.7	355	90	1	111	0.601	0.489	
<b>DEM. REP. CONGO</b>																								
Beni	00°30'N	028°28'E	—	—	—	—	05:15:51.1	320	43	05:24:10.2	26	189	06:56:41.7	78	150	38	05:22:00.9	353	76	16	112	0.910	0.828	
Boula	01°34'N	038°15'E	—	—	—	—	05:15:05.9	286	348	05:27:05.4	88	161	06:59:09.9	80	150	39	05:23:05.0	353	74	17	113	0.910	0.828	
Burebo	00°09'N	029°17'E	—	—	—	—	—	—	—	—	—	—	06:56:02.1	78	150	38	05:21:43.1	353	76	16	113	0.906	0.827	
Isiro	02°47'N	027°37'E	—	—	—	—	05:17:25.8	255	337	05:25:10.8	91	172	06:53:59.9	82	152	35	05:21:37.7	373	255	18	113	0.909	0.827	
Kananga	05°54'S	022°25'E	—	—	—	—	—	—	—	—	—	—	06:51:46.2	66	150	32	05:16:32.7	354	88	3	113	0.650	0.545	
Kikinda	00°16'S	015°18'E	—	—	—	—	—	—	—	—	—	—	06:28:47.6	66	152	28	05:14:45.4	354	88	3	111	0.650	0.545	
Kolwezi	00°30'S	025°12'E	—	—	—	—	—	—	—	—	—	—	06:47:07.6	76	152	32	05:18:37.6	354	79	12	112	0.851	0.773	
Libreville	10°43'S	025°28'E	—	04:11:06.8	287	29	3	—	—	—	—	—	06:38:21.8	58	147	34	05:18:56.3	353	89	16	109	0.577	0.463	
Libreville	11°40'S	027°28'E	—	04:11:24.2	288	29	3	—	—	—	—	—	06:41:13.8	57	146	37	05:19:47.1	353	89	18	109	0.569	0.454	
Libreville	06°09'S	023°38'E	—	—	—	—	—	—	—	—	—	—	06:39:40.8	66	150	31	05:17:08.5	354	86	12	110	0.684	0.584	
<b>DJIBOUTI</b>																								
Djibouti	11°36'N	041°09'E	7	04:22:23.3	240	313	11	—	—	—	—	—	07:02:18.3	94	132	58	05:58:30.2	368	230	30	123	0.616	0.587	
<b>EGYPT</b>																								
Cairo	30°03'N	031°15'E	116	—	—	—	—	—	—	—	—	—	07:04:33.6	122	164	23	05:53:45.1	379	232	11	122	0.289	0.173	
<b>EQUATORIAL GUINEA</b>																								
Malabo, Bioko	03°45'N	008°47'E	—	—	—	—	06:28:50.7	75	150	11	05:28	Rise	—	—	—	—	—	—	—	0	111	0.602	0.510	
<b>ERITREA</b>																								
Asmara	15°20'N	038°53'E	2335	04:24:26.1	237	388	6	—	—	—	—	—	07:27:05.1	101	144	42	05:45:31.2	379	233	23	122	0.548	0.433	
<b>ETHIOPIA</b>																								
Addis Ababa	09°02'N	038°42'E	2450	04:14:29.2	247	205	6	—	—	—	—	—	07:25:58.8	92	141	45	05:38:44.9	379	239	25	118	0.701	0.685	
<b>GABON</b>																								
Libreville	00°23'N	009°27'E	35	—	—	—	—	—	—	—	—	—	06:26:43.6	70	154	13	05:38	Rise	—	—	0	111	0.642	0.535
<b>GHANA</b>																								
Accra	05°33'N	008°13'W	27	—	—	—	—	—	—	—	—	—	06:25:09.1	72	156	2	05:16	Rise	—	—	0	111	0.112	0.843
<b>KENYA</b>																								
Nairobi	00°31'N	038°17'E	—	04:06:25.9	263	331	4	05:24:12.6	248	328	05:32:21.7	86	175	07:11:40.0	79	145	46	05:23:35.3	372	252	23	113	0.912	0.831
Kisumu	00°06'S	034°45'E	—	04:06:07.1	264	333	7	05:23:18.4	275	356	05:31:27.0	84	149	07:09:44.0	78	145	46	05:27:22.0	382	73	23	113	0.912	0.831
Machakos	00°02'N	033°46'E	—	04:06:38.1	265	344	7	05:23:11.9	240	320	05:32:46.3	86	180	07:10:44.0	78	145	46	05:27:22.0	382	73	26	114	0.912	0.832
Mombasa	00°03'S	037°59'E	—	04:07:03.6	262	349	7	05:27:01.9	240	320	05:35:24.1	102	181	07:12:21.0	78	145	46	05:27:22.0	382	73	26	114	0.912	0.832
Nairobi	04°03'S	039°40'E	16	04:07:26.1	269	354	10	05:27:21.9	240	320	05:35:24.1	102	181	07:12:21.0	78	145	46	05:27:22.0	382	73	26	114	0.912	0.832
Nairobi	04°03'S	039°40'E	16	04:07:26.1	269	354	10	05:27:21.9	240	320	05:35:24.1	102	181	07:12:21.0	78	145	46	05:27:22.0	382	73	26	114	0.912	0.832
Nairobi	01°17'S	036°49'E	1830	04:06:29.4	265	354	6	05:26:11.6	297	18	05:33:05.0	45	126	07:14:52.8	76	142	48	05:29:38.0	351	72	25	113	0.912	0.832
Nairobi	00°17'S	036°04'E	—	04:06:27.5	263	352	3	05:24:49.5	268	348	05:33:13.4	75	155	07:13:24.2	76	145	48	05:29:38.0	351	72	24	113	0.912	0.832
<b>LESOTHO</b>																								
Maseru	29°28'S	027°30'E	—	04:56:04.4	328	83	18	—	—	—	—	—	06:01:21.1	15	127	32	05:27:48.3	352	305	25	101	0.084	0.028	
<b>LIBYA</b>																								
Benghazi	32°07'N	028°04'E	35	—	—	—	—	—	—	—	—	—	06:50:09.3	122	170	12	05:45:13.7	372	227	1	115	0.368	0.288	
Tripoli	32°54'N	013°11'E	22	—	—	—	—	—	—	—	—	—	06:45:58.6	120	171	6	06:12	Rise	—	0	115	0.268	0.155	

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center

TABLE 2.8  
LOCAL CIRCUMSTANCES FOR AFRICA: MADAGASCAR TO ZIMBABWE  
ANNUAL SOLAR ECLIPSE OF 2010 JANUARY 15

Location Name	Latitude	Longitude	Elev.	First Contact				Second Contact				Third Contact				Fourth Contact				Maximum Eclipse				Eclips. Obs.	Mag.	Eclips. Depth	Durat.
				h	m	s	U.T.	h	m	s	U.T.	h	m	s	U.T.	h	m	s	U.T.	h	m	s	U.T.				
<b>MADAGASCAR</b>																											
Antananarivo	18°55'E	047°31'E	—	04:23:50.7	288	30	26	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Manakara	21°20'E	047°05'E	—	04:26:19.9	294	37	27	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>MALAWI</b>																											
Blantyre	13°47'E	035°00'E	—	04:13:13.8	280	33	12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lilongwe	13°54'E	037°46'E	—	04:12:53.0	288	29	9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>MAYOTTE</b>																											
Dzaoudzi	12°47'E	045°17'E	—	04:14:29.4	279	15	20	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>MOZAMBIQUE</b>																											
Beira	19°49'E	034°52'E	8	04:22:07.5	298	44	14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Maputo	25°58'E	032°35'E	58	04:38:25.6	313	64	18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>NAMIBIA</b>																											
Windhoek	22°34'E	017°06'E	1728	04:38:33.9	318	71	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>NGER</b>																											
Niamey	13°31'N	002°07'E	216	—	—	—	06:19:44.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>NGERIA</b>																											
Ibadan	07°37'N	003°20'E	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Kano	12°03'N	009°20'E	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lagos	06°27'N	003°24'E	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Ogburno	08°08'N	004°15'E	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>RWANDA</b>																											
Kigali	01°53'E	030°06'E	—	04:05:39.9	270	2	0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>SOMALIA</b>																											
Mogadishu	00°22'E	042°32'E	—	04:09:36.6	260	345	12	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
—	02°04'N	045°22'E	12	04:13:17.9	254	336	15	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>SOUTH AFRICA</b>																											
Bloubaai	29°12'E	026°07'E	—	04:56:07.4	329	84	17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Durban	29°55'E	030°56'E	3	04:55:52.8	326	83	21	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Johannesburg	26°15'E	028°00'E	—	04:41:42.8	317	70	14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Pretoria	25°45'E	028°10'E	1369	04:39:50.7	316	68	14	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>SUDAN</b>																											
Khartoum	15°36'N	032°32'E	390	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>SWAZILAND</b>																											
Mbabane	26°18'E	031°06'E	—	04:40:09.6	315	67	17	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>TANZANIA</b>																											
Dar-es-Salaam	06°48'E	039°17'E	14	04:07:34.9	272	5	11	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mwanza	02°31'E	032°56'E	—	04:05:37.9	269	1	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>TOGO</b>																											
Lome	06°08'N	001°13'E	22	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>TUNISIA</b>																											
Tunis	36°48'N	010°11'E	66	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>UGANDA</b>																											
Kampala	00°26'N	032°12'E	—	04:05:34.6	264	353	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Kampala	00°19'N	032°25'E	1312	04:05:44.0	265	354	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Musoke	00°23'E	031°44'E	—	04:05:34.7	266	356	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Musoke	01°05'N	034°10'E	—	04:06:17.5	262	350	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>ZAMBIA</b>																											
Thoboyandou	23°00'E	030°29'E	—	04:30:29.5	307	57	13	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>ZAMBIA</b>																											
Kitwe	12°49'E	028°13'E	—	04:12:29.5	289	31	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Lusaka	15°25'E	028°17'E	1277	04:15:56.6	294	38	6	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Mokola	12°58'E	028°38'E	—	04:12:35.0	289	31	4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>ZIMBABWE</b>																											
Bulawayo	20°03'E	028°36'E	1343	04:24:25.0	303	53	9	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Harare	17°58'E	031°03'E	1472	04:19:03.3	286	42	10	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center

TABLE 2.9  
LOCAL CIRCUMSTANCES FOR EUROPE  
ANNUAL SOLAR ECLIPSE OF 2010 JANUARY 15

Location Name	Latitude	Longitude	Elev. m	First Contact			Second Contact			Third Contact			Fourth Contact			Maximum Eclipse			Eclips. Mag.	Eclips. Obs.	Universal Depth	Universal Durat.	
				U.T.	P	V	U.T.	P	V	U.T.	P	V	U.T.	P	V	U.T.	P	V					
ALBANIA																							
Tirana	41°20'N	015°50'E	7	—	—	—	—	—	—	—	—	—	06:50:35.6	134	175	7	06:06	81sec	—	0.116	0.171	0.380	
AUSTRIA																							
Vienna	48°13'N	016°20'E	202	—	—	—	—	—	—	—	—	—	06:49:59.4	142	179	1	06:43	81sec	—	0.322	0.835	0.808	
BOSNIA & HERZEGOVINA																							
Sarajevo	43°52'N	018°25'E	—	—	—	—	—	—	—	—	—	—	06:50:06.2	157	177	4	06:19	81sec	—	0.119	0.139	0.853	
BULGARIA																							
Sofia	42°41'N	023°19'E	550	—	—	—	—	—	—	—	—	—	06:52:22.2	138	176	0	06:07:33.3	169	212	0.121	0.133	0.855	
CROATIA																							
Zagreb	45°48'N	015°58'E	—	—	—	—	—	—	—	—	—	—	06:49:41.8	159	178	2	06:35	81sec	—	0.320	0.872	0.822	
CZECH REPUBLIC																							
Prague	49°50'N	015°27'E	—	—	—	—	—	—	—	—	—	—	06:50:06.7	146	180	1	06:41	81sec	—	0.323	0.835	0.807	
GREECE																							
Athens	37°59'N	023°43'E	107	—	—	—	—	—	—	—	—	—	06:53:36.0	131	173	11	05:58:41.2	170	218	0.119	0.200	0.101	
HUNGARY																							
Budapest	47°30'N	019°25'E	120	—	—	—	—	—	—	—	—	—	06:50:37.0	143	179	3	06:29	81sec	—	0.322	0.878	0.825	
ITALY																							
Naples	40°51'N	014°17'E	25	—	—	—	—	—	—	—	—	—	06:48:26.8	131	175	3	06:27	81sec	—	0.118	0.133	0.856	
Rome	41°54'N	012°29'E	115	—	—	—	—	—	—	—	—	—	06:48:37.8	131	175	2	06:37	81sec	—	0.118	0.875	0.824	
MACEDONIA																							
Skopje	41°59'N	022°26'E	240	—	—	—	—	—	—	—	—	—	06:51:23.4	138	176	7	06:04:37.4	178	214	0.119	0.153	0.869	
MOLDOVA																							
Kishinev	47°50'N	028°50'E	—	05:53:56.6	388	226	1	—	—	—	—	—	06:54:32.5	147	179	8	06:23:37.1	168	203	0.328	0.867	0.836	
POLAND																							
Warsaw	52°03'N	019°58'E	220	—	—	—	—	—	—	—	—	—	06:50:06.9	147	181	2	06:35	81sec	—	0.323	0.847	0.832	
ROMANIA																							
Bucharest	50°15'N	021°00'E	90	—	—	—	—	—	—	—	—	—	06:49:28.7	151	183	1	06:41	81sec	—	0.325	0.827	0.804	
RUSSIA																							
Barnaul	46°26'N	026°40'E	82	—	—	—	—	—	—	—	—	—	06:53:42.7	142	177	9	06:14:39.5	169	208	0.324	0.866	0.835	
RUSSIA																							
Chelyabinsk	53°22'N	083°45'E	—	07:14:50.2	195	189	15	—	—	—	—	—	09:12:37.6	114	91	8	08:15:27.6	154	139	12	364	0.257	0.122
Irkutsk	55°30'N	061°24'E	—	07:09:55.3	375	183	13	—	—	—	—	—	09:05:41.2	141	141	14	07:37:37.4	158	162	14	374	0.840	0.809
Krasnoyarsk	56°20'N	094°00'E	467	07:25:12.7	181	181	13	—	—	—	—	—	09:12:08.1	114	82	6	08:26:10.0	154	156	4	827	0.439	0.330
Novosibirsk	55°50'N	087°50'E	—	07:17:43.7	395	186	13	—	—	—	—	—	09:16:03.3	155	139	10	08:13:59	108	120	0.285	0.285	0.120	
Novosibirsk	56°01'N	092°50'E	152	07:21:06.2	200	188	11	—	—	—	—	—	09:20:51.2	110	86	2	08:22:52.2	155	135	7	534	0.275	0.161
Novosibirsk	53°45'N	087°50'E	—	07:16:56.0	397	189	14	—	—	—	—	—	09:17:44.1	111	87	6	08:18:35.2	154	137	11	588	0.253	0.143
Novosibirsk	55°50'N	082°55'E	—	07:16:02.3	383	187	13	—	—	—	—	—	09:06:58.0	117	86	8	08:12:55.2	155	141	11	583	0.200	0.102
Omsk	55°00'N	073°24'E	85	07:12:04.1	386	186	14	—	—	—	—	—	08:44:46.5	126	113	12	07:59:06.8	156	149	13	350	0.322	0.849
Tosk	56°30'N	084°58'E	—	07:18:10.7	394	187	12	—	—	—	—	—	09:07:35.3	117	96	6	08:14:04.0	155	141	9	495	0.202	0.103
Ufa	54°44'N	055°56'E	174	07:08:59.0	370	183	12	—	—	—	—	—	07:44:20.4	149	135	14	07:26:40.4	153	168	13	166	0.815	0.802
Vladivostok	43°10'N	131°56'E	29	07:40:17.5	240	199	3	—	—	—	—	—	—	—	—	—	08:00	84c	—	0.311	0.250	0.140	
Yokohama	48°44'N	014°25'E	—	06:55:30.3	375	200	12	—	—	—	—	—	07:14:34.3	151	171	15	06:54:57.8	163	185	14	347	0.818	0.803
SERBIA AND MONTENEGRO																							
Belgrade	44°50'N	020°30'E	138	—	—	—	—	—	—	—	—	—	06:50:48.0	140	178	5	06:14	81sec	—	0.320	0.319	0.847	
SLOVAKIA																							
Bratislava	48°09'N	017°07'E	—	—	—	—	—	—	—	—	—	—	06:50:02.9	143	179	1	06:39	81sec	—	0.322	0.848	0.832	
SLOVENIA																							
Ljubljana	46°03'N	014°31'E	—	—	—	—	—	—	—	—	—	—	06:49:33.1	138	177	1	06:42	81sec	—	0.321	0.841	0.830	
UKRAINE																							
Kiev	50°26'N	030°31'E	—	06:14:52.8	179	212	2	—	—	—	—	—	06:51:29.6	154	183	7	06:32:53.8	167	198	4	131	0.820	0.803
Odessa	46°28'N	030°44'E	65	05:54:59.7	188	225	2	—	—	—	—	—	06:56:02.1	147	178	10	06:24:53.2	167	202	6	129	0.855	0.835

TABLE 2.10  
LOCAL CIRCUMSTANCES FOR JAPAN

Location Name	Latitude	Longitude	Elev. m	First Contact			Second Contact			Third Contact			Fourth Contact			Maximum Eclipse			Eclips. Mag.	Eclips. Obs.	Universal Depth	Universal Durat.
				U.T.	P	V	U.T.	P	V	U.T.	P	V	U.T.	P	V	U.T.	P	V				
JAPAN																						
Fukuoka	33°35'N	130°24'E	—	07:45:50.8	253	204	8	—	—	—	—	—	—	—	—	—	—	—	0.245	0.560	0.440	
Kobe	34°24'N	135°27'E	—	07:46:59.3	253	204	8	—	—	—	—	—	—	—	—	—	—	—	0.245	0.437	0.313	
Osaka	34°33'N	135°50'E	—	07:48:14.8	253	204	7	—	—	—	—	—	—	—	—	—	—	—	0.245	0.253	0.434	
Yokohama	35°30'N	139°41'E	—	07:47:18.9	253	204	3	—	—	—	—	—	—	—	—	—	—	—	0.244	0.139	0.828	
Nagoya	36°40'N	136°52'E	—	07:47:58.8	253	204	2	—	—	—	—	—	—	—	—	—	—	—	0.244	0.243	0.131	

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center

TABLE 2.11

LOCAL CIRCUMSTANCES FOR THE MIDDLE EAST  
ANULAR SOLAR ECLIPSE OF 2010 JANUARY 15

Location Name	Latitude	Longitude	Elev. m	First Contact			Second Contact			Third Contact			Fourth Contact			Maximum Eclipse			Eclip. Mag.	Eclip. Obs.	Universal Depth Durat.					
				U.T.	h	m	U.T.	h	m	U.T.	h	m	U.T.	h	m	U.T.	h	m								
<b>ARMENIA</b>																										
Yerevan	40°11'N	044°30'E	—	05:54:55.2	191	228	14	—	—	—	—	—	—	—	—	07:28:46.8	136	157	24	06:40:26.6	164	193	19	143	0.097	0.035
<b>AZERBAIJAN</b>																										
Baku	40°23'N	049°51'E	—	06:06:42.1	190	221	18	—	—	—	—	—	—	—	—	07:47:06.3	132	146	27	06:55:48.3	161	184	23	151	0.102	0.038
<b>BAHRAIN</b>																										
Al-Muharraq	26°13'N	050°35'E	—	05:12:34.2	212	269	20	—	—	—	—	—	—	—	—	08:07:36.9	111	122	42	06:34:44.9	162	198	33	143	0.304	0.187
<b>GEORGIA</b>																										
Tbilisi	41°43'N	044°49'E	—	06:02:33.4	188	223	14	—	—	—	—	—	—	—	—	07:27:44.1	138	159	23	06:44:30.4	163	191	19	146	0.081	0.026
<b>IRAN</b>																										
Tehran	35°40'N	051°38'E	1587	05:39:09.2	202	242	31	—	—	—	—	—	—	—	—	08:05:07.9	119	129	35	06:49:21.6	161	188	30	149	0.205	0.105
Qom	34°39'N	050°54'E	—	05:45:20.1	199	247	20	—	—	—	—	—	—	—	—	07:53:29.3	123	134	33	06:50:44.7	161	188	28	149	0.175	0.084
Shiraz	29°37'N	052°33'E	—	05:29:33.1	206	258	22	—	—	—	—	—	—	—	—	08:12:51.3	116	121	38	06:47:39.6	160	189	33	149	0.254	0.144
Tehran	35°40'N	051°26'E	1200	05:50:36.0	197	233	20	—	—	—	—	—	—	—	—	08:00:17.1	124	134	32	06:53:28.4	160	186	28	151	0.163	0.075
<b>IRAQ</b>																										
Sarra	30°30'N	047°47'E	—	05:22:30.5	206	253	17	—	—	—	—	—	—	—	—	07:54:38.7	119	127	36	06:32:42.8	163	198	28	141	0.228	0.125
Basra	30°20'N	047°06'E	223	05:36:35.1	199	241	12	—	—	—	—	—	—	—	—	07:29:08.3	131	155	27	06:29:44.8	165	200	20	139	0.146	0.044
Baghdad	33°21'N	044°25'E	34	05:26:13.3	203	245	14	—	—	—	—	—	—	—	—	07:36:13.3	125	149	31	06:27:42.7	164	201	23	138	0.187	0.092
<b>ISRAEL</b>																										
Jerusalem	31°46'N	035°14'E	809	05:03:35.2	211	265	4	—	—	—	—	—	—	—	—	07:11:49.2	125	162	25	06:03:22.8	168	216	15	127	0.227	0.130
<b>JORDAN</b>																										
Amman	31°57'N	035°56'E	776	05:06:18.9	211	264	5	—	—	—	—	—	—	—	—	07:13:17.2	125	161	26	06:05:42.3	168	215	15	128	0.221	0.125
<b>KUWAIT</b>																										
Kuwait City	29°20'N	047°59'E	5	05:18:26.0	208	257	17	—	—	—	—	—	—	—	—	07:53:37.7	117	135	37	06:31:18.2	163	199	29	141	0.245	0.140
<b>LEBANON</b>																										
Beirut	33°53'N	035°30'E	—	05:11:29.9	207	259	5	—	—	—	—	—	—	—	—	07:11:18.6	128	163	24	06:07:47.9	169	213	14	128	0.202	0.103
<b>OMAN</b>																										
Muscat	23°37'N	058°35'E	—	05:22:39.2	215	269	29	—	—	—	—	—	—	—	—	08:45:23.6	98	88	45	07:01:46.4	156	179	43	157	0.386	0.264
<b>SAUDI ARABIA</b>																										
Mecqa	21°27'N	038°49'E	—	04:39:09.7	226	228	7	—	—	—	—	—	—	—	—	07:20:52.3	110	146	38	05:55:39.1	169	223	23	126	0.411	0.288
Yiadhi	24°38'N	046°43'E	591	04:59:39.5	217	272	15	—	—	—	—	—	—	—	—	07:52:26.8	111	133	41	05:19:44.4	165	208	29	136	0.328	0.210
<b>SYRIA</b>																										
Damascus	33°30'N	036°18'E	720	05:11:26.5	208	259	5	—	—	—	—	—	—	—	—	07:13:14.6	128	162	25	06:08:37.1	168	212	15	129	0.204	0.105
<b>TURKEY</b>																										
Ankara	39°55'N	032°52'E	861	05:30:46.7	198	243	9	—	—	—	—	—	—	—	—	07:03:05.1	137	171	17	06:14:50.1	188	208	10	129	0.124	0.059
Sams	40°11'N	029°04'E	—	—	—	—	—	—	—	—	—	—	—	—	—	06:57:58.6	137	173	14	06:09:29.6	189	211	7	125	0.137	0.058
Izmir	41°01'N	028°58'E	18	—	—	—	—	—	—	—	—	—	—	—	—	06:57:31.6	138	174	13	06:11:42.8	189	210	6	125	0.126	0.052
Tamir	38°25'N	027°09'E	28	—	—	—	—	—	—	—	—	—	—	—	—	06:56:27.5	133	172	14	06:03:27.1	189	215	5	122	0.173	0.082
<b>UNITED ARAB EMIRATES</b>																										
Abu Dhabi	24°28'N	054°22'E	—	05:10:24.0	216	263	24	—	—	—	—	—	—	—	—	08:26:04.9	104	106	44	06:46:45.4	159	190	38	148	0.346	0.225
<b>YEMEN</b>																										
Sana	15°23'N	044°12'E	—	04:30:50.2	233	302	12	—	—	—	—	—	—	—	—	07:46:17.3	99	131	46	05:57:41.7	167	224	30	126	0.524	0.406

TABLE 2.12

LOCAL CIRCUMSTANCES FOR CENTRAL ASIA  
ANULAR SOLAR ECLIPSE OF 2010 JANUARY 15

Location Name	Latitude	Longitude	Elev.	First Contact			Second Contact			Third Contact			Fourth Contact			Maximum Eclipse			Eclip. Mag.	Eclip. Obs.	Universal Depth Durat.
				U.T.	h	m	U.T.	h	m	U.T.	h	m	U.T.	h	m	U.T.	h	m			
<b>KAZAKHSTAN</b>																					
Alma-Ata	43°15'N	076°57'E	775	06:54:49.2	199	288	26	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>KYRGYZSTAN</b>																					
Bishkek	42°54'N	074°36'E	—	06:51:24.1	197	281	26	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>MONGOLIA</b>																					
Ulaanbaatar	47°55'N	106°52'E	1387	07:26:01.7	218	353	14	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>TAJKISTAN</b>																					
Dushanbe	38°25'N	068°48'E	—	06:33:06.6	196	211	29	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>TURKMENISTAN</b>																					
Ashgabat	37°57'N	058°22'E	—	06:13:24.0	196	228	24	—	—	—	—	—	—	—	—	—	—	—	—	—	—
<b>UZBEKISTAN</b>																					
Tashkent	41°20'N	069°18'E	—	06:41:09.1	195	286	26	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center



TABLE 2.13  
LOCAL CIRCUMSTANCES FOR SOUTH ASIA  
ANNUAL SOLAR ECLIPSE OF 2010 JANUARY 15

Location Name	Latitude	Longitude	K1ev.	First Contact			Second Contact			Third Contact			Fourth Contact			Maximum Eclipse			Kclip.	Relap. Mag.	Ubral. Depth.		
				h	m	s	h	m	s	h	m	s	h	m	s	h	m	s					
<b>AFGHANISTAN</b>																							
Babul	34°31'N	68°12'E	1815	08:22:24.6	203	220	32	—	—	—	—	—	09:13:24.3	101	77	29	07:51:13.4	151	147	34	185	0.322	0.203
<b>BANGLADESH</b>																							
Chittagong	23°20'N	89°15'E	—	06:45:36.1	233	218	45	—	—	—	—	—	10:01:47.9	61	4	37	08:32:53.2	166	164	33	223	0.888	0.825
Dacca	23°43'N	89°25'E	—	06:44:06.7	230	218	44	—	—	—	—	—	10:00:58.7	64	9	38	08:31:36.9	147	137	32	221	0.844	0.770
Phulica	23°43'N	88°33'E	—	06:48:38.3	230	220	45	—	—	—	—	—	10:00:10.2	64	9	39	08:29:01.6	146	137	35	220	0.850	0.776
Rajshahi	24°22'N	88°38'E	—	06:48:45.9	228	219	44	—	—	—	—	—	09:59:24.9	67	14	39	08:29:08.2	147	139	34	218	0.800	0.720
<b>BHUTAN</b>																							
Thimbu	27°28'N	88°39'E	—	06:47:54.3	225	219	41	—	—	—	—	—	09:58:53.2	71	19	36	08:32:14.3	147	131	31	219	0.751	0.663
<b>INDIA</b>																							
Alleshabad	23°02'N	72°37'E	55	05:57:16.2	218	243	42	—	—	—	—	—	09:33:32.6	61	42	35	07:52:21.6	148	137	45	191	0.564	0.450
Amarnath	08°42'N	77°28'E	—	05:37:05.7	238	275	54	—	—	—	—	—	09:36:28.8	56	260	41	07:46:08.7	145	123	58	201	0.918	0.843
Aruppukottai	08°31'N	78°06'E	—	05:46:53.1	230	271	54	—	—	—	—	—	09:36:26.1	56	260	40	07:49:10.6	145	121	57	203	0.918	0.842
Bangalore	12°59'N	77°35'E	895	05:46:31.4	233	262	52	—	—	—	—	—	09:41:07.4	62	8	38	07:53:29.7	146	123	53	202	0.848	0.774
Bombay	18°58'N	72°50'E	6	05:46:43.5	223	254	44	—	—	—	—	—	09:34:30.4	75	33	38	07:49:10.7	147	130	48	191	0.645	0.541
Calcutta	22°32'N	88°22'E	6	06:37:15.5	229	222	46	—	—	—	—	—	09:59:05.9	64	10	30	08:27:34.8	146	108	36	219	0.935	0.761
Delhi	28°40'N	77°13'E	—	06:23:15.6	214	235	39	—	—	—	—	—	09:40:59.6	64	44	37	08:09:10.3	149	139	38	200	0.921	0.433
Hyderabad	17°23'N	78°29'E	531	05:59:24.0	228	248	49	—	—	—	—	—	09:45:17.8	67	16	33	08:02:00.3	146	122	45	204	0.771	0.687
Kolpur	26°33'N	77°49'E	—	06:15:45.8	215	230	40	—	—	—	—	—	09:39:11.3	63	43	32	08:04:37.8	140	121	40	208	0.542	0.425
Kanpur	26°28'N	80°21'E	—	06:25:15.6	219	225	42	—	—	—	—	—	09:46:12.2	78	33	35	08:14:36.1	147	122	38	206	0.622	0.514
Karalkuul	10°04'N	78°47'E	—	05:44:15.1	237	268	54	—	—	—	—	—	09:40:04.7	56	360	39	07:52:05.5	145	139	55	204	0.918	0.842
Kanpur	26°28'N	80°21'E	—	06:25:15.6	219	225	42	—	—	—	—	—	09:46:12.2	78	33	35	08:14:36.1	147	122	38	206	0.622	0.514
Kasikudi	10°04'N	78°47'E	—	05:44:15.1	237	268	54	—	—	—	—	—	09:40:04.7	56	360	39	07:52:05.5	145	139	55	204	0.918	0.842
Kumbakonam	10°58'N	77°23'E	—	05:48:18.5	236	264	54	—	—	—	—	—	09:41:55.6	67	0	37	07:55:08.5	145	138	54	206	0.917	0.842
Kudkote	26°51'N	80°55'E	122	06:27:28.0	219	224	42	—	—	—	—	—	09:40:56.7	78	33	35	08:16:22.5	147	121	37	207	0.623	0.516
Madurai	13°05'N	80°17'E	16	05:35:32.4	234	256	53	—	—	—	—	—	09:45:13.9	59	3	35	08:00:40.5	145	130	51	208	0.892	0.823
Madurai	08°56'N	78°07'E	—	05:43:47.0	237	270	54	—	—	—	—	—	09:36:56.7	57	1	40	07:50:02.5	145	131	56	203	0.918	0.842
Madurai	10°46'N	77°50'E	—	05:49:17.7	237	263	55	—	—	—	—	—	09:42:18.8	56	359	37	07:53:39.5	145	138	54	207	0.917	0.842
Madurai	08°10'N	77°26'E	—	05:38:16.2	239	276	54	—	—	—	—	—	09:35:44.9	55	358	42	07:45:07.1	145	123	55	201	0.918	0.843
Madurai	21°09'N	77°06'E	—	06:29:53.8	224	238	46	—	—	—	—	—	09:47:09.6	71	23	30	08:07:46.4	146	122	44	203	0.708	0.611
Madurai	28°36'N	77°12'E	212	06:23:04.2	214	225	39	—	—	—	—	—	09:41:00.7	84	44	47	08:09:06.0	148	139	38	208	0.532	0.434
Madurai	08°43'N	77°46'E	—	05:38:02.4	239	274	54	—	—	—	—	—	09:36:54.5	56	359	41	07:46:55.5	145	132	58	202	0.918	0.843
Madurai	25°36'N	85°07'E	—	06:34:42.2	223	221	43	—	—	—	—	—	09:55:27.8	72	32	32	08:23:51.9	147	134	38	213	0.717	0.623
Madurai	10°23'N	77°49'E	—	05:45:01.4	237	267	54	—	—	—	—	—	09:40:28.0	57	0	38	07:52:42.1	145	139	53	203	0.918	0.842
Madurai	18°32'N	77°52'E	—	05:48:34.2	224	253	45	—	—	—	—	—	09:36:47.1	73	29	37	07:50:44.5	147	134	49	193	0.670	0.570
Madurai	08°53'N	77°56'E	—	05:34:31.1	238	276	55	—	—	—	—	—	09:35:19.6	57	2	42	07:43:38.5	146	126	48	196	0.915	0.842
Madurai	08°27'N	77°34'E	—	05:38:15.2	237	272	54	—	—	—	—	—	09:37:32.6	57	1	41	07:47:42.9	145	132	57	201	0.918	0.842
Madurai	09°27'N	77°49'E	—	05:39:47.8	238	272	54	—	—	—	—	—	09:37:55.7	57	0	40	07:48:24.9	145	132	57	202	0.918	0.842
Madurai	10°48'N	77°09'E	—	05:47:02.9	236	265	54	—	—	—	—	—	09:41:25.1	57	0	38	07:54:15.8	145	138	55	205	0.918	0.842
Madurai	08°44'N	77°42'E	—	05:37:57.5	238	274	54	—	—	—	—	—	09:36:52.7	56	359	41	07:46:51.6	145	132	58	202	0.918	0.843
Madurai	08°29'N	77°55'E	—	05:34:47.5	238	276	54	—	—	—	—	—	09:35:20.7	56	0	42	07:44:11.6	146	135	49	199	0.918	0.842
Madurai	08°47'N	77°08'E	—	05:39:32.5	239	273	55	—	—	—	—	—	09:37:35.4	56	358	41	07:48:09.3	145	132	58	203	0.918	0.842
Madurai	09°36'N	77°58'E	—	05:48:33.8	237	271	54	—	—	—	—	—	09:36:20.0	57	0	40	07:48:05.1	145	132	57	202	0.918	0.842
Madurai	17°42'N	88°18'E	—	06:14:24.9	231	239	51	—	—	—	—	—	09:52:15.1	62	7	38	08:13:35.9	145	132	44	213	0.850	0.777
<b>MALDIVES</b>																							
Male	04°10'N	73°30'E	—	05:15:21.5	244	296	51	—	—	—	—	—	09:23:15.1	54	258	50	07:25:44.2	337	321	65	166	0.919	0.844
<b>NIPAL</b>																							
Patna	27°43'N	85°19'E	1348	06:38:03.6	221	218	41	—	—	—	—	—	09:55:01.9	75	27	30	08:25:19.0	147	116	34	213	0.677	0.577
<b>PAKISTAN</b>																							
Faisalabad	31°25'N	73°05'E	—	06:23:23.2	208	223	36	—	—	—	—	—	09:26:42.7	82	60	38	08:00:19.0	150	138	36	183	0.422	0.299
Faisalabad	31°42'N	73°10'E	—	06:27:56.4	206	218	39	—	—	—	—	—	09:26:10.3	86	60	37	08:01:33.6	150	139	34	182	0.386	0.266
Karachi	24°22'N	66°03'E	4	03:48:11.0	213	246	36	—	—	—	—	—	09:16:43.9	80	63	39	07:36:19.0	151	132	44	178	0.452	0.330
Lahore	31°35'N	74°18'E	—	06:24:24.7	209	221	36	—	—	—	—	—	09:21:38.9	91	58	38	08:03:32.5	149	136	36	195	0.436	0.314
<b>SRI LANKA</b>																							
Colombo	06°56'N	79°51'E	7	05:42:04.1	242	275	57	—	—	—	—	—	09:37:24.6	51	351	40	07:49:34.8	325	296	18	207	0.702	0.833
Cattina	09°40'N	80°00'E	—	05:47:41.8	236	266	56	—	—	—	—	—	09:41:17.0	54	356	38	07:54:38.4	325	296	18	207	0.818	0.842

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center

TABLE 2.14  
LOCAL CIRCUMSTANCES FOR SOUTHEAST ASIA  
ANNUAL SOLAR ECLIPSE OF 2010 JANUARY 15

Location Name	Latitude	Longitude	Elev.	Ecliptic Contact			Third Contact			Fourth Contact			Maximum Eclipse			Eclip. Mag.	Eclip. Obs.	Universal Depth	Universal Durm.					
				h	m	s	h	m	s	h	m	s	h	m	s									
<b>BRUNEI DARUSSALAM</b>																								
Bandar Seri Begu	04°56'N	114°55'E	3	07:45:00.8	286	219	35	—	—	—	—	—	09:33:42.6	31	291	11	00:42:35.2	329	254	23	245	0.235	0.132	
<b>BURMA (MYANMAR)</b>																								
Chauk	20°54'N	094°50'E	—	06:53:16.7	237	217	45	08:32:31.5	268	223	08:39:46.7	24	336	15:02:58.7	57	357	15	08:36:09.4	327	280	32	227	0.213	0.836
Laung	22°56'N	097°45'E	—	07:00:15.4	230	212	42	08:34:37.1	275	224	08:44:26.2	23	334	15:04:16.2	57	357	15	08:40:59.4	327	279	27	229	0.212	0.832
Mawlaik	22°09'N	094°55'E	—	06:50:39.4	238	218	45	08:34:37.1	275	224	08:44:26.2	23	334	15:04:16.2	57	357	15	08:40:59.4	327	279	27	229	0.212	0.832
Mawlaik	22°09'N	094°55'E	77	06:55:10.1	237	215	44	08:34:37.1	275	224	08:44:26.2	23	334	15:04:16.2	57	357	15	08:40:59.4	327	279	27	229	0.212	0.832
Mawlaik	22°02'N	096°28'E	—	06:56:26.6	238	214	43	08:35:27.7	271	223	08:42:17.6	23	334	15:04:16.2	57	357	15	08:40:59.4	327	279	27	229	0.212	0.832
Mawlaik	22°02'N	095°52'E	—	06:53:16.7	237	215	44	08:34:37.1	275	224	08:44:26.2	23	334	15:04:16.2	57	357	15	08:40:59.4	327	279	27	229	0.212	0.832
Mawlaik	22°05'N	095°08'E	—	06:53:16.7	237	215	44	08:34:37.1	275	224	08:44:26.2	23	334	15:04:16.2	57	357	15	08:40:59.4	327	279	27	229	0.212	0.832
Mawlaik	21°28'N	095°23'E	—	06:53:16.7	237	215	44	08:34:37.1	275	224	08:44:26.2	23	334	15:04:16.2	57	357	15	08:40:59.4	327	279	27	229	0.212	0.832
Mawlaik	25°23'N	097°24'E	—	07:01:03.3	235	211	39	08:39:18.9	281	236	08:43:57.9	113	368	15:05:17.4	61	411	08:41:38.2	326	280	31	228	0.212	0.832	
Mawlaik	21°20'N	095°06'E	—	06:53:16.7	237	215	44	08:34:37.1	275	224	08:44:26.2	23	334	15:04:16.2	57	357	15	08:40:59.4	327	279	27	229	0.212	0.832
Mawlaik	22°34'N	095°42'E	—	06:55:10.1	237	215	44	08:34:37.1	275	224	08:44:26.2	23	334	15:04:16.2	57	357	15	08:40:59.4	327	279	27	229	0.212	0.832
Mawlaik	20°09'N	092°54'E	—	06:48:26.0	236	210	47	08:34:37.1	275	224	08:44:26.2	23	334	15:04:16.2	57	357	15	08:40:59.4	327	279	27	229	0.212	0.832
Mawlaik	16°47'N	096°10'E	—	06:50:16.3	234	219	46	08:34:37.1	275	224	08:44:26.2	23	334	15:04:16.2	57	357	15	08:40:59.4	327	279	27	229	0.212	0.832
Mawlaik	20°25'N	094°52'E	—	06:50:16.3	234	219	46	08:34:37.1	275	224	08:44:26.2	23	334	15:04:16.2	57	357	15	08:40:59.4	327	279	27	229	0.212	0.832
<b>CAMBODIA</b>																								
Phnom Penh	11°33'N	104°55'E	12	07:22:28.0	261	215	46	—	—	—	—	—	09:54:22.9	33	321	13	00:40:15.8	327	264	29	238	0.548	0.432	
<b>LAOS</b>																								
Vientiane	17°58'N	102°36'E	370	07:08:17.0	249	213	43	—	—	—	—	—	10:02:44.3	45	340	10	00:43:10.7	327	271	27	234	0.738	0.647	
<b>INDONESIA</b>																								
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung	06°54'E	107°26'E	—	07:28:09.0	301	226	49	—	—	—	—	—	08:54:53.9	351	266	31	00:18:21.9	326	245	48	248	0.084	0.028	
Bandung																								



TABLE 2.15  
LOCAL CIRCUMSTANCES FOR CHINA, NORTH AND SOUTH KOREA  
ANNUAL SOLAR ECLIPSE OF 2010 JANUARY 15

Location Name	Latitude	Longitude	Elev.	First Contact			Second Contact			Third Contact			Fourth Contact			Maximum Eclipse			Eclips. Obs.	Thermal Daych. Durat.							
				h	m	s	h	m	s	h	m	s	h	m	s	h	m	s			u.p.	p	v				
<b>CHINA</b>																											
Beiyuan	25°09'N	099°58'E	—	07:05:09.7	237	310	39	08:39:20.5	232	186	08:47:35.0	63	15	10:05:54.5	60	1	9	08:43:28.3	149	100	25	239	0.93	0.831	0.905	08a14e	
Beijing	39°55'N	116°25'E	—	07:32:48.0	034	198	15	—	—	—	—	—	—	—	—	—	—	08:52:28.4	153	169	3	239	0.823	0.743	—	—	
Chengdu	30°33'N	104°04'E	261	07:17:12.4	123	204	30	—	—	—	—	—	—	—	—	—	—	08:54:34e	—	—	—	0.241	0.568	0.453	—	—	
Chongqing	29°34'N	106°55'E	—	07:10:53.1	239	204	29	08:46:47.9	239	191	08:54:37.4	69	10	10:06:53.2	65	9	3	08:46:50.3	150	103	17	232	0.895	0.819	0.887	0.994	
Chongzuo	25°02'N	101°30'E	—	07:09:40.9	239	209	37	08:42:13.7	249	240	08:48:22.6	6	10	10:06:30.6	58	35	7	08:45:48.0	150	103	17	231	0.920	0.877	0.926	0.954	
Chongzuo	26°30'N	102°51'E	—	07:13:23.6	239	207	35	08:44:32.0	241	232	08:50:27.5	16	23	10:06:58.7	56	35	6	08:47:30.3	149	103	17	232	0.911	0.832	0.926	0.926	
Dukou	26°40'N	101°35'E	—	07:11:07.4	237	207	35	08:42:19.4	236	189	08:50:25.8	61	12	10:06:45.2	60	2	6	08:47:30.3	148	100	21	231	0.911	0.832	0.926	0.926	
Kuoni	30°17'N	109°13'E	—	07:23:05.8	240	203	27	08:48:37.3	265	215	08:53:57.4	36	34	—	—	—	—	08:52:27.6	150	103	28	13	230	0.909	0.828	0.926	0.926
Fuling	29°42'N	107°21'E	—	07:22:05.5	239	204	29	08:47:35.0	232	186	08:54:37.4	60	10	10:07:30.5	61	3	1	08:51:24.2	150	103	28	13	230	0.907	0.827	0.948	0.948
Guangzhou	23°25'N	113°36'E	—	07:20:21.0	240	202	23	08:49:39.7	236	187	08:57:32.7	60	16	—	—	—	—	08:53:26.6	151	103	17	232	0.908	0.825	0.918	0.918	
Guangzhou	23°06'N	113°36'E	16	07:31:06.3	254	207	29	—	—	—	—	—	—	—	—	—	—	08:53:56.2	150	103	27	13	240	0.706	0.610	—	—
Harbin	45°45'N	126°41'E	145	07:36:57.9	234	197	5	—	—	—	—	—	—	—	—	—	—	08:53:56e	—	—	—	0.240	0.432	0.308	—	—	
Hefei	35°17'N	115°27'E	—	07:32:32.9	239	201	19	08:51:23.5	204	155	08:57:34.3	100	51	—	—	—	—	08:54:19.0	152	103	5	239	0.907	0.823	0.904	0.904	
Jinan	36°40'N	116°57'E	—	07:33:46.4	239	200	17	08:51:23.5	204	155	08:57:34.3	100	51	—	—	—	—	08:54:19.0	152	103	5	239	0.907	0.823	0.904	0.904	
Jingnan	31°00'N	112°09'E	—	07:29:00.2	242	203	24	08:51:23.5	204	155	08:57:34.3	100	51	—	—	—	—	08:54:19.0	152	103	5	239	0.907	0.823	0.904	0.904	
Jingnan	32°31'N	113°20'E	—	07:28:13.9	239	202	23	08:49:37.8	236	187	08:57:06.4	71	21	—	—	—	—	08:53:22.4	151	103	17	232	0.908	0.825	0.918	0.918	
Jingnan	34°51'N	114°21'E	—	07:31:27.7	239	201	18	08:51:23.5	204	155	08:57:34.3	100	51	—	—	—	—	08:54:19.0	152	103	5	239	0.907	0.823	0.904	0.904	
Kaifeng	34°51'N	114°21'E	—	07:31:27.7	239	201	18	08:51:23.5	204	155	08:57:34.3	100	51	—	—	—	—	08:54:19.0	152	103	5	239	0.907	0.823	0.904	0.904	
Laosuo	36°12'N	117°42'E	—	07:34:32.4	240	201	18	08:51:23.5	204	155	08:57:34.3	100	51	—	—	—	—	08:54:19.0	152	103	5	239	0.907	0.823	0.904	0.904	
Leoban	29°34'N	103°45'E	—	07:16:23.3	236	205	31	08:46:36.3	198	131	08:50:32.0	120	72	10:07:03.0	63	6	3	08:48:36.9	149	102	18	232	0.910	0.828	0.927	0.927	
Lianyungang	34°29'N	119°16'E	—	07:36:20.7	243	201	16	08:52:52.8	241	230	08:58:32.8	24	33	—	—	—	—	08:54:42.8	153	281	3	242	0.906	0.822	0.914	0.914	
Luda	38°53'N	121°25'E	—	07:36:55.5	239	199	12	—	—	—	—	—	—	—	—	—	—	08:54:42.8	153	281	3	242	0.906	0.822	0.914	0.914	
Ludong	38°54'N	121°25'E	—	07:36:55.5	239	199	12	—	—	—	—	—	—	—	—	—	—	08:54:42.8	153	281	3	242	0.906	0.822	0.914	0.914	
Manning	32°03'N	118°47'E	—	07:36:36.0	246	202	18	08:45:55.3	240	191	08:53:48.5	59	10	10:07:24.3	61	3	2	08:49:52.4	152	280	17	233	0.920	0.828	0.908	0.908	
Nanjing	32°03'N	118°47'E	—	07:36:36.0	246	202	18	08:45:55.3	240	191	08:53:48.5	59	10	10:07:24.3	61	3	2	08:49:52.4	152	280	17	233	0.920	0.828	0.908	0.908	
Ningbo	33°00'N	121°25'E	—	07:29:29.8	240	202	22	08:50:02.4	233	183	08:57:29.7	70	20	—	—	—	—	08:53:46.4	151	102	9	230	0.908	0.824	0.949	0.949	
Qingdao	36°35'N	120°03'E	—	07:18:29.1	237	206	31	08:46:07.4	211	163	08:53:03.9	88	39	10:07:16.8	62	5	2	08:49:35.8	150	103	17	233	0.910	0.828	0.921	0.921	
Qingdao	35°45'N	115°03'E	—	07:30:21.4	239	201	21	08:50:54.6	241	232	08:57:26.3	82	32	—	—	—	—	08:53:55.7	152	102	8	238	0.908	0.824	0.949	0.949	
Pingdingshan	35°42'N	114°59'E	—	07:32:02.3	238	200	19	08:52:48.6	240	192	08:53:30.3	134	85	—	—	—	—	08:53:55.7	152	102	8	238	0.908	0.824	0.949	0.949	
Puyang	35°42'N	114°59'E	—	07:32:02.3	238	200	19	08:52:48.6	240	192	08:53:30.3	134	85	—	—	—	—	08:53:55.7	152	102	8	238	0.908	0.824	0.949	0.949	
Qingdao	36°06'N	120°10'E	—	07:36:50.5	242	201	15	08:51:23.5	204	155	08:57:34.3	100	51	—	—	—	—	08:54:19.0	152	103	5	239	0.907	0.823	0.904	0.904	
Rizhao	35°27'N	119°29'E	—	07:36:19.0	242	201	18	08:51:23.5	204	155	08:57:34.3	100	51	—	—	—	—	08:54:19.0	152	103	5	239	0.907	0.823	0.904	0.904	
<b>HONG KONG</b>																											
Shanghai	31°14'N	121°28'E	5	07:39:36.2	250	203	16	—	—	—	—	—	—	—	—	—	—	08:57:08.3	153	277	3	243	0.932	0.832	0.732	0.732	
Shenyang	41°48'N	123°22'E	42	07:37:04.3	237	198	9	—	—	—	—	—	—	—	—	—	—	08:57:08.3	153	277	3	243	0.932	0.832	0.732	0.732	
Shenyang	41°48'N	123°22'E	42	07:37:04.3	237	198	9	—	—	—	—	—	—	—	—	—	—	08:57:08.3	153	277	3	243	0.932	0.832	0.732	0.732	
Shenyang	41°48'N	123°22'E	42	07:37:04.3	237	198	9	—	—	—	—	—	—	—	—	—	—	08:57:08.3	153	277	3	243	0.932	0.832	0.732	0.732	
Shenyang	41°48'N	123°22'E	42	07:37:04.3	237	198	9	—	—	—	—	—	—	—	—	—	—	08:57:08.3	153	277	3	243	0.932	0.832	0.732	0.732	
Shenyang	41°48'N	123°22'E	42	07:37:04.3	237	198	9	—	—	—	—	—	—	—	—	—	—	08:57:08.3	153	277	3	243	0.932	0.832	0.732	0.732	
Shenyang	41°48'N	123°22'E	42	07:37:04.3	237	198	9	—	—	—	—	—	—	—	—	—	—	08:57:08.3	153	277	3	243	0.932	0.832	0.732	0.732	
Shenyang	41°48'N	123°22'E	42	07:37:04.3	237	198	9	—	—	—	—	—	—	—	—	—	—	08:57:08.3	153	277	3	243	0.932	0.832	0.732	0.732	
Shenyang	41°48'N	123°22'E	42	07:37:04.3	237	198	9	—	—	—	—	—	—	—	—	—	—	08:57:08.3	153	277	3	243	0.932	0.832	0.732	0.732	
Shenyang	41°48'N	123°22'E	42	07:37:04.3	237	198	9	—	—	—	—	—	—	—	—	—	—	08:57:08.3	153	277	3	243	0.932	0.832	0.732	0.732	
Shenyang	41°48'N	123°22'E	42	07:37:04.3	237	198	9	—	—	—	—	—	—	—	—	—	—	08:57:08.3	153	277	3	243	0.932	0.832	0.732	0.732	
Shenyang	41°48'N	123°22'E	42	07:37:04.3	237	198	9	—	—	—	—	—	—	—	—	—	—	08:57:08.3	153	277	3	243	0.932	0.832	0.732	0.732	
Shenyang	41°48'N	123°22'E	42	07:37:04.3	237	198	9	—	—	—	—	—	—	—	—	—	—	08:57:08.3	153	277	3	243	0.932	0.832	0.732		

Table 2.16: Climate Statistics for January along the Annular Eclipse Path													
January Climate Statistics	Percent of possible sunshine	Percent Frequency of Sky Condition						Calculated Cloudiness	Prevailing wind	January Rainfall mm	Days with Rain	Average January High °C	Average January Low °C
		Clear	Few	Scattered	Broken	Overcast	Obscured	%					
<b>Central African Republic</b>													
Bouar *		32.5	14.4	18.7	30.6	2.9	1	38					
Bossangoa *		29.9	21.4	17.1	27.8	3.9	0	36	calm				
Bangui *	59	20.4	10.5	21.9	40.6	4.7	1.7	49	calm	25	3	32	20
Mobaye *		16	15	15.5	46	4.5	3	53	calm				
<b>Democratic Republic of the Congo</b>													
Mbandaka		11.6	10.9	5.8	51.4	18.1	2.2	65					
Buta		15.6	11.1	6.7	40	26.7	0	63					
Kisangani	50	2.8	5.2	9.1	58.4	23.4	1.3	75		53	6	31	21
<b>Uganda</b>													
Soroti *		2	9.8	20.6	56.6	8.3	0.5	95					
Asua *	63	2.6	9.3	24.4	63.2	0.5	0	62		12	6	30	
Masindi *		5.7	21.1	22.8	45.5	4.9	0	54			5	31	17
Entebbe Airport *	62	1.2	8.9	14.3	52.9	22.8	0	72	S	100	9	29	14
Kampala *	41	0	4.5	8.9	65.2	21.4	0	77		46	9	28	18
Jimia *		3.8	13	22.1	43.5	16.8	0.8	63					
<b>Kenya</b>													
Kusumu	74	3.6	24.9	22.3	45.2	3.9	0.2	53	E	48	6	29	18
Kitale *	69	7.9	30.8	17.2	40.5	3.1	0.5	48	E - NE	20	8	27	11
Eldoret *		6.9	28	20.5	42.4	2.1	0	40	E - NE	34	3	27	5
Lodwar	85	15.8	32.8	20.5	29.8	1.1	0	38	calm	9	1	36	22
Nairobi *	78	7.5	16.3	20	50.1	6.2	0	57	N - NE	58	4	26	11
Garissa *	67	0.9	2.4	8.7	71.9	16	0	76	S - SE			37	23
Mombasa	71	0	5	26	63.9	5.2	0	67	calm	34	3	33	22
Lamu* (coast)		0	4.3	25.2	69	1.5	0	67	E		1	30	26
<b>Seychelles</b>													
Seychelles Airport (Victoria)	40	0	2	15.6	68.9	13.4	0	74	W	379	17	30	24
<b>Maldives</b>													
Hanimaadhoo		0.5	51.4	15.5	30.9	1.7	0	41					
Male *	67	0	24.7	24.9	44.9	5.5	0	55		75	3	30	25
Kadhdhoo		0	28.2	19.5	43.1	9.2	0	56					
<b>India</b>													
Minicoy	77	1.7	23.6	36.7	34.5	3.5	0	50	NE	13	1.7	31	23
Kolsam (Goan)										20	1.2		
Thiruvananthapuram	72	4.1	29.7	28.8	35.3	2	0	47	SW	23	1.6	32	22
Madurai *	71	11.4	36.5	18	26.9	7.2	0	42		16	1	30	21
Cuddalore		7	27.7	31.3	30.4	3.6	0	45				29	21
<b>Sri Lanka</b>													
Columbo	66	3.2	20.5	25.6	43.6	7.1	0	56	NE	58	5	31	22
Jaffna										70	4	29	23
Trincomalee		0	12.5	16.3	59.6	11.5	0	67	NE	116	7	28	24
<b>Bangladesh</b>													
Car's Bazar		69.5	14.5	9.9	5.3	0.8	0	12		0		26	15
<b>Burma</b>													
Sittou *	79	56.5	17.7	13.8	10.8	1.3	0	19		11	<1	28	15
Mindat		32.2	32.7	15.9	15.9	1.9	1.4	26		4		19	9
Kalewa *		11.1	46.6	24.1	11.1	4.6	0.5	32		2		26	13
Mandalay *	82	51.3	32.6	8.5	6.2	1.4	0	15		4	0.1	29	13
Lashio *	75	19.9	42.1	19.2	24.8	2.6	1.5	31		8	1	25	5
<b>China</b>													
Tengchong *	74	11.6	46.8	8.7	28.3	4.4	0	38		15	2.8	16	1
Zichang *	72	25.5	47.1	3.9	16.2	7.4	0	29		6	1.2	16	4
Kunming	69	24.1	32.5	8.4	25.3	9.7	0	38	SW	12	2.2	15	2
Chongqing *		15.8	2	0.7	9.9	71.6	0	80		20	10	10	6
Yichang *	29	21.2	5.7	2.3	21.8	48.8	0.2	68		19	3.8	9	2
Zengzhou *	51	33.4	9.6	3.4	24.6	27	2	51		9	1.8	6	-5
Qingdao *	60	36.8	12.3	5.4	19.2	23.9	2.4	46		11	1.9	3	-4

Table 2.15: Climate statistics for January are given for sites along the annular eclipse path. Location names with a star (\*) are in the annular eclipse path.

Explanation of columns:

Percent of possible sunshine: the average number of daily sunshine hours recorded at the station for the month divided by the duration of day light.  
This is the best estimate of the probability of seeing the eclipse.

Sky condition: Clear means no cloud, few means 1 or 2 oktas (eights) of sky cover, scattered means 3 or 4 oktas, broken means 5 to 7 oktas, and overcast means no sky visible at all. Obscured refers to a fog layer through which the sky cannot be seen; it is treated as overcast.

Calculated cloudiness: an average cloudiness derived from the frequency and sky cover in the sky condition columns.

Prevailing wind: the most common direction from which the wind blows during the month.

Rainfall: average monthly rainfall

Days with rain: average number of days in January with 0.2 mm of rain or more.

Average high, low: average daily maximum and minimum temperatures for January.

Località	Longitude	Latitude	Elvn	1st Contact				Maximum				4th Contact				Central	
				U.T.			PA	Alt	PA	U.T.			PA	Mag	Durn		
				h	m	s	o			o	h	m	s			o	o
	o	'	o	'	m	h	m	s	o	o	h	m	s	o	o		sec
Agrigento	13	36	37	17	230	..	..	..	..	..	6	47	19	..	..	..	..
Alessandria	8	36	44	54	95	..	..	..	..	..	..	..	..	..	..	..	..
Ancona	13	30	43	37	16	..	..	..	..	..	6	48	51	..	..	..	..
Aosta	7	19	45	44	583	..	..	..	..	..	..	..	..	..	..	..	..
Arezzo	11	53	43	27	296	..	..	..	..	..	6	48	33	133	0	..	..
Ascoli piceno	13	34	42	51	154	..	..	..	..	..	6	48	41	133	2	..	..
Asti	8	12	44	54	123	..	..	..	..	..	..	..	..	..	..	..	..
Avellino	14	47	40	54	348	..	..	..	..	..	6	48	33	131	3	..	..
Bari	16	52	41	07	5	..	..	..	..	..	6	49	17	133	5	..	..
Belluno	12	13	46	08	383	..	..	..	..	..	6	49	16	137	-1	..	..
Benevento	14	46	41	07	135	..	..	..	..	..	6	48	35	132	3	..	..
Bergamo	9	39	45	42	249	..	..	..	..	..	..	..	..	..	..	..	..
Bologna	11	21	44	29	84	..	..	..	..	..	6	48	47	134	-1	..	..
Bolzano	11	21	46	29	262	..	..	..	..	..	..	..	..	..	..	..	..
Brescia	10	13	45	32	149	..	..	..	..	..	..	..	..	..	..	..	..
Brindisi	17	46	40	39	15	..	..	..	..	..	6	49	35	132	6	..	..
Cagliari	9	07	39	13	4	..	..	..	..	..	6	46	49	126	0	..	..
Caltanissetta	14	03	37	28	568	..	..	..	..	..	6	47	31	126	5	..	..
Campobasso	14	39	41	33	786	..	..	..	..	..	6	48	37	132	3	..	..
Caserta	14	19	41	04	68	..	..	..	..	..	6	48	27	131	3	..	..
Catania	15	05	37	30	47	..	..	..	..	..	6	47	57	127	5	..	..
Catanzaro	16	35	38	54	343	..	..	..	..	..	6	48	50	129	6	..	..
Chieti	14	10	42	21	330	..	..	..	..	..	6	48	41	133	2	..	..
Como	9	15	45	47	201	..	..	..	..	..	..	..	..	..	..	..	..
Cosenza	16	15	39	17	238	..	..	..	..	..	6	48	45	130	5	..	..
Cremona	10	01	45	08	45	..	..	..	..	..	..	..	..	..	..	..	..
Cuneo	7	33	44	23	534	..	..	..	..	..	..	..	..	..	..	..	..
Enna	14	17	37	32	931	..	..	..	..	..	6	47	37	126	5	..	..
Ferrara	11	35	44	50	9	..	..	..	..	..	6	48	54	135	-1	..	..
Firenze	11	15	43	45	184	..	..	..	..	..	6	48	34	133	0	..	..
Foggia	15	32	41	27	72	..	..	..	..	..	6	48	53	132	4	..	..
Forlì	12	02	44	13	34	..	..	..	..	..	6	48	47	134	0	..	..
Frosinone	13	21	41	38	291	..	..	..	..	..	6	48	21	132	2	..	..
Genova	8	55	44	25	108	..	..	..	..	..	..	..	..	..	..	..	..
Gorizia	13	37	45	56	84	..	..	..	..	..	6	49	21	137	0	..	..
Grosseto	11	06	42	45	10	..	..	..	..	..	6	48	16	132	0	..	..
Imperia	8	01	43	52	22	..	..	..	..	..	..	..	..	..	..	..	..
Isernia	14	15	41	24	0	..	..	..	..	..	6	48	31	132	3	..	..
L'aquila	13	24	42	21	714	..	..	..	..	..	6	48	31	133	2	..	..
La spezia	9	49	44	05	3	..	..	..	..	..	..	..	..	..	..	..	..
Latina	12	54	41	27	21	..	..	..	..	..	6	48	13	131	2	..	..
Lecce	18	10	40	21	49	..	..	..	..	..	6	49	43	132	6	..	..
Livorno	10	18	43	31	3	..	..	..	..	..	6	48	24	132	-1	..	..
Lucca	10	30	43	50	327	..	..	..	..	..	..	..	..	..	..	..	..
Macerata	13	25	43	17	314	..	..	..	..	..	6	48	45	134	1	..	..
Mantova	10	47	45	09	19	..	..	..	..	..	..	..	..	..	..	..	..
Massa	10	08	44	01	65	..	..	..	..	..	..	..	..	..	..	..	..
Matera	16	36	40	39	399	..	..	..	..	..	6	49	6	132	5	..	..
Messina	15	34	38	11	3	..	..	..	..	..	6	48	17	128	5	..	..
Milano	9	11	45	27	122	..	..	..	..	..	..	..	..	..	..	..	..
Modena	10	53	44	38	34	..	..	..	..	..	..	..	..	..	..	..	..
Napoli	14	15	40	51	115	..	..	..	..	..	6	48	23	131	3	..	..
Novara	8	37	45	26	159	..	..	..	..	..	..	..	..	..	..	..	..
Nuoro	9	20	40	19	532	..	..	..	..	..	6	47	13	128	0	..	..
Oristano	8	36	39	54	3	..	..	..	..	..	6	46	59	127	0	..	..
Padova	11	52	45	24	38	..	..	..	..	..	6	49	5	136	-1	..	..
Palermo	13	22	38	08	23	..	..	..	..	..	6	47	28	127	4	..	..
Parma	10	20	44	48	55	..	..	..	..	..	..	..	..	..	..	..	..
Pavia	9	09	45	11	77	..	..	..	..	..	..	..	..	..	..	..	..
Perugia	12	23	43	06	493	..	..	..	..	..	6	48	32	133	1	..	..
Pesaro	12	54	43	54	11	..	..	..	..	..	6	48	49	134	1	..	..
Pescara	14	12	42	27	4	..	..	..	..	..	6	48	44	133	2	..	..
Piacenza	9	41	45	03	80	..	..	..	..	..	..	..	..	..	..	..	..
Pisa	10	23	43	43	4	..	..	..	..	..	..	..	..	..	..	..	..
Pistoia	10	55	43	55	65	..	..	..	..	..	6	48	35	133	-1	..	..
Pordenone	12	38	45	57	0	..	..	..	..	..	6	49	16	137	0	..	..
Potenza	15	48	40	38	820	..	..	..	..	..	6	48	48	131	4	..	..
Ragusa	14	45	36	56	502	..	..	..	..	..	6	47	40	126	5	..	..
Ravenna	12	12	44	25	4	..	..	..	..	..	6	48	52	135	0	..	..
Reggio calabria	15	38	38	06	15	..	..	..	..	..	6	48	18	128	5	..	..
Reggio emilia	10	37	44	41	58	..	..	..	..	..	..	..	..	..	..	..	..
Rieti	12	51	42	24	406	..	..	..	..	..	6	48	26	132	1	..	..
Roma	12	27	41	55	143	..	..	..	..	..	6	48	14	131	1	..	..
Rovigo	11	47	45	04	7	..	..	..	..	..	6	48	59	135	-1	..	..
Salerno	14	45	40	40	4	..	..	..	..	..	6	48	30	131	3	..	..
Sassari	8	33	40	43	225	..	..	..	..	..	..	..	..	..	..	..	..
Savona	8	29	44	18	4	..	..	..	..	..	..	..	..	..	..	..	..
Siena	11	20	43	19	322	..	..	..	..	..	6	48	27	133	0	..	..
Siracusa	15	18	37	03	17	..	..	..	..	..	6	47	57	126	6	..	..
Sondrio	9	52	46	10	307	..	..	..	..	..	..	..	..	..	..	..	..
Taranto	17	13	40	28	15	..	..	..	..	..	6	49	20	132	5	..	..
Teramo	13	44	42	39	398	..	..	..	..	..	6	48	39	133	2	..	..
Terni	12	38	42	33	130	..	..	..	..	..	6	48	26	132	1	..	..
Torino	7	41	45	04	239	..	..	..	..	..	..	..	..	..	..	..	..
Trapani	12	30	38	01	3	..	..	..	..	..	6	47	11	126	3	..	..
Trento	11	07	46	03	194	..	..	..	..	..	..	..	..	..	..	..	..
Treviso	12	14	45	39	15	..	..	..	..	..	6	49	10	136	-1	..	..
Trieste	13	45	45	38	67	..	..	..	..	..	6	49	19	137	0	..	..
Udine	13	14	46	03	113	..	..	..	..	..	6	49	21	137	0	..	..
Varese	8	48	45	00	000	..	..	..	..	..	..	..	..	..	..	..	..
Venezia	12	20	45	26	1	..	..	..	..	..	6	49	8	136	0	..	..
Vercelli	8	25	45	19	130	..	..	..	..	..	..	..	..	..	..	..	..
Verona	10	59	45	26	59	..	..	..	..	..	..	..	..	..	..	..	..

Vicenza	11 32	45 32	39	.. .. .	... ..	.. .. .	..	...	.. .. .	... ..	.....	....
Viterbo	12 06	42 24	325	.. .. .	... ..	.. .. .	..	...	6 48 18	132 1	.....	....

NB: poichè il Sole sorge già eclissato e l'eclisse è nella fase terminale, il massimo relativo avverrà proprio nell'istante in cui il Sole sorge.

© (8)

P1, Primo contatto : punto della Terra in cui l'eclisse inizia come parziale al sorgere del Sole  
P2, Secondo contatto : punto della Terra in cui l'eclisse finisce come parziale al sorgere del Sole  
P3, Terzo contatto : punto della Terra in cui l'eclisse inizia come parziale al tramonto del Sole  
P4, Quarto contatto : punto della Terra in cui l'eclisse finisce come parziale al tramonto del Sole

U1, Primo contatto : punto della Terra in cui l'eclisse inizia come totale al sorgere del Sole  
U2, Secondo contatto : punto della Terra in cui l'eclisse finisce come totale al sorgere del Sole  
U3, Terzo contatto : punto della Terra in cui l'eclisse inizia come totale al tramonto del Sole  
U4, Quarto contatto : punto della Terra in cui l'eclisse finisce come totale al tramonto del Sole

P1, first contact : point of the Earth in which the eclipse begins as partial at sunrising  
P2, second contact : point of the Earth in which the eclipse ends as partial at sunrising  
P3, Terzo contatto : point of the Earth in which the eclipse begins as partial at sunseting  
P4, Quarto contatto : point of the Earth in which the eclipse ends as partial at sunseting

U1, first contact : point of the Earth in which the eclipse begins as total at sunrising  
U2, second contact : point of the Earth in which the eclipse ends as total at sunrising  
U3, third contact : point of the Earth in which the eclipse begins as total at sunseting  
U4, fourth contact : point of the Earth in which the eclipse ends as total at sunseting

# Partial Lunar Eclipse of 2010 Jun 26

Geocentric Conjunction = 11:27:23.7 UT      J.D. = 2455373.97736  
 Greatest Eclipse = 11:38:28.7 UT      J.D. = 2455373.98505

Penumbral Magnitude = 1.6033      P. Radius = 1.2118°      Gamma = -0.7090  
 Umbral Magnitude = 0.5419      U. Radius = 0.6768°      Axis = 0.6557°

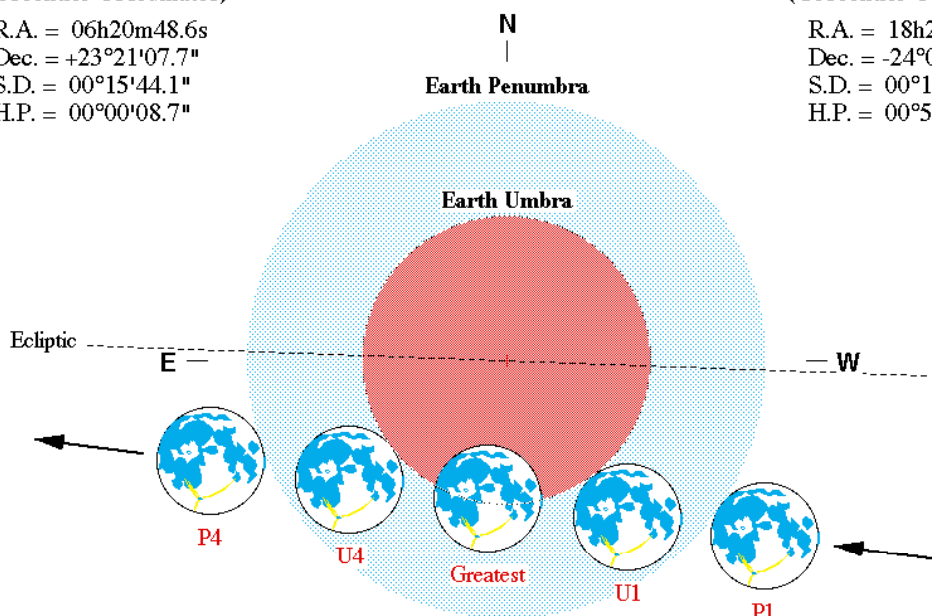
Saros Series = 120      Member = 58 of 84

## Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 06h20m48.6s  
 Dec. = +23°21'07.7"  
 S.D. = 00°15'44.1"  
 H.P. = 00°00'08.7"

## Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 18h21m11.8s  
 Dec. = -24°00'06.5"  
 S.D. = 00°15'07.3"  
 H.P. = 00°55'29.7"



## Eclipse Semi-Durations

Penumbral = 02h42m55s  
 Umbral = 01h21m54s

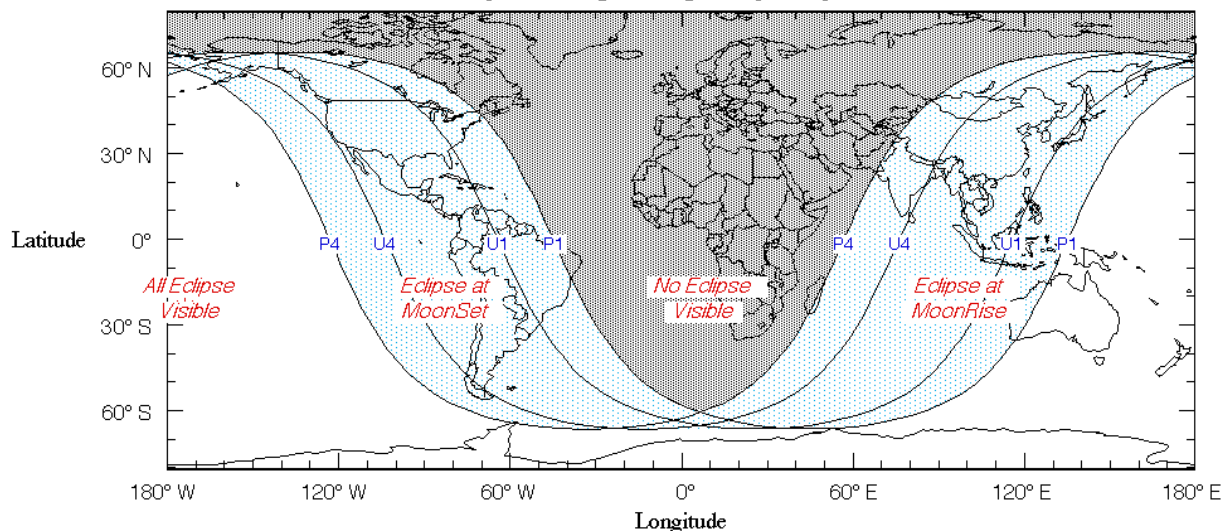
## Eclipse Contacts

P1 = 08:55:34 UT  
 U1 = 10:16:32 UT  
 U4 = 13:00:19 UT  
 P4 = 14:21:25 UT

Eph. = Newcomb/ILE  
 $\Delta T = 67.1$  s

F. Espenak, NASA's GSFC - 2004 Jul 07

<http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html>



Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center

# Total Solar Eclipse of 2010 Jul 11

Geocentric Conjunction = 19:50:57.5 UT      J.D. = 2455389.327055  
 Greatest Eclipse = 19:33:33.6 UT      J.D. = 2455389.314973

Eclipse Magnitude = 1.0580      Gamma = -0.6789

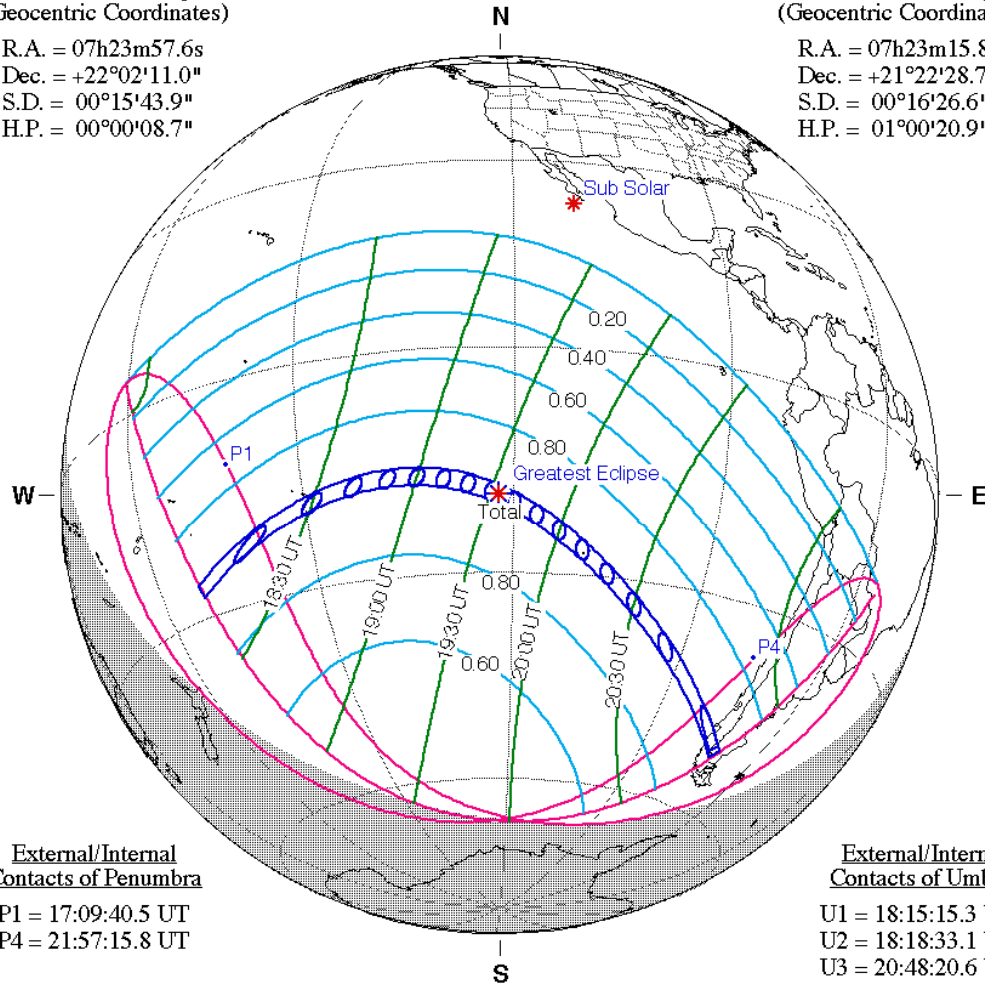
Saros Series = 146      Member = 27 of 76

## Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 07h23m57.6s  
 Dec. = +22°02'11.0"  
 S.D. = 00°15'43.9"  
 H.P. = 00°00'08.7"

## Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 07h23m15.8s  
 Dec. = +21°22'28.7"  
 S.D. = 00°16'26.6"  
 H.P. = 01°00'20.9"



## External/Internal Contacts of Penumbra

P1 = 17:09:40.5 UT  
 P4 = 21:57:15.8 UT

## External/Internal Contacts of Umbra

U1 = 18:15:15.3 UT  
 U2 = 18:18:33.1 UT  
 U3 = 20:48:20.6 UT  
 U4 = 20:51:42.2 UT

## Local Circumstances at Greatest Eclipse

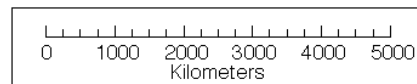
Lat. = 19°45.7'S      Sun Alt. = 47.1°  
 Long. = 121°52.9'W      Sun Azm. = 13.5°  
 Path Width = 258.7 km      Duration = 05m20.2s

## Ephemeris & Constants

Eph. = Newcomb/ILE  
 $\Delta T = 67.1$  s  
 $k1 = 0.2724880$   
 $k2 = 0.2722810$   
 $\Delta b = 0.0''$      $\Delta l = 0.0''$

## Geocentric Libration (Optical + Physical)

$l = -3.24^\circ$   
 $b = 0.86^\circ$   
 $c = 6.62^\circ$   
 Brown Lun. No. = 1083



F. Espenak, NASA's GSFC - Fri, Jul 2,  
[sunearth.gsfc.nasa.gov/eclipse/eclipse.html](http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html)

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center

# PATH OF THE UMBRAL SHADOW TOTAL SOLAR ECLIPSE OF 2010 JULY 11

ΔT = 66.2 s

Universal Time	Northern Limit		Southern Limit		Central Line		Sun Path		
	Latitude	Longitude	Latitude	Longitude	Latitude	Longitude	Alt °	Width km	Durat. s
Limits	26°02.9'S	171°10.7'W	27°40.6'S	170°48.2'W	26°51.4'S	170°59.5'W	0	179	02m42.4s
18:20	20°50.8'S	157°59.3'W	23°57.1'S	161°17.4'W	22°19.8'S	159°27.6'W	12	197	03m15.1s
18:25	18°54.4'S	152°08.8'W	21°29.5'S	154°04.9'W	20°10.7'S	153°03.5'W	19	209	03m37.8s
18:30	17°44.8'S	147°59.6'W	20°10.9'S	149°29.3'W	18°57.0'S	148°42.5'W	24	219	03m55.0s
18:35	16°58.8'S	144°38.3'W	19°20.7'S	145°54.6'W	18°09.2'S	145°15.0'W	28	227	04m09.5s
18:40	16°28.2'S	141°46.0'W	18°47.8'S	142°54.2'W	17°37.6'S	142°19.0'W	32	235	04m22.1s
18:45	16°09.0'S	139°13.5'W	18°27.2'S	140°16.4'W	17°17.7'S	139°44.0'W	35	241	04m33.3s
18:50	15°58.9'S	136°55.3'W	18°16.1'S	137°54.5'W	17°07.1'S	137°24.2'W	37	247	04m43.1s
18:55	15°56.2'S	134°48.0'W	18°12.7'S	135°44.6'W	17°04.1'S	135°15.7'W	39	252	04m51.7s
19:00	16°00.1'S	132°49.1'W	18°16.0'S	133°43.8'W	17°07.7'S	133°15.9'W	41	256	04m59.1s
19:05	16°09.8'S	130°56.9'W	18°25.2'S	131°50.1'W	17°17.2'S	131°23.1'W	43	259	05m05.4s
19:10	16°24.8'S	129°10.0'W	18°39.8'S	130°02.0'W	17°31.9'S	129°35.6'W	44	261	05m10.5s
19:15	16°44.7'S	127°27.2'W	18°59.3'S	128°18.3'W	17°51.7'S	127°52.5'W	45	262	05m14.6s
19:20	17°09.4'S	125°47.7'W	19°23.6'S	126°38.0'W	18°16.1'S	126°12.6'W	46	262	05m17.5s
19:25	17°38.6'S	124°10.6'W	19°52.4'S	125°00.1'W	18°45.1'S	124°35.1'W	47	261	05m19.4s
19:30	18°12.2'S	122°35.1'W	20°25.7'S	123°23.8'W	19°18.6'S	122°59.4'W	47	260	05m20.3s
19:35	18°50.3'S	121°00.7'W	21°03.5'S	121°48.5'W	19°56.5'S	121°24.5'W	47	258	05m20.0s
19:40	19°32.9'S	119°26.5'W	21°45.8'S	120°13.4'W	20°38.9'S	119°49.9'W	47	255	05m18.8s
19:45	20°20.0'S	117°51.9'W	22°32.7'S	118°37.7'W	21°25.9'S	118°14.8'W	46	252	05m16.5s
19:50	21°11.9'S	116°16.2'W	23°24.5'S	117°00.6'W	22°17.7'S	116°38.5'W	46	249	05m13.3s
19:55	22°08.7'S	114°38.5'W	24°21.4'S	115°21.3'W	23°14.5'S	115°00.0'W	45	245	05m09.1s
20:00	23°10.9'S	112°57.8'W	25°23.8'S	113°38.6'W	24°16.8'S	113°18.4'W	43	241	05m03.9s
20:05	24°18.9'S	111°13.1'W	26°32.3'S	111°51.5'W	25°25.0'S	111°32.6'W	42	237	04m57.8s
20:10	25°33.4'S	109°23.0'W	27°47.7'S	109°58.3'W	26°39.9'S	109°41.0'W	40	233	04m50.7s
20:15	26°55.2'S	107°25.6'W	29°10.9'S	107°57.0'W	28°02.3'S	107°41.8'W	38	228	04m42.7s
20:20	28°25.7'S	105°18.6'W	30°43.3'S	105°44.8'W	29°33.7'S	105°32.3'W	36	224	04m33.7s
20:25	30°06.6'S	102°58.5'W	32°27.2'S	103°17.8'W	31°16.0'S	103°09.0'W	33	219	04m23.6s
20:30	32°00.8'S	100°20.1'W	34°25.8'S	100°29.7'W	33°12.2'S	100°26.0'W	30	214	04m12.3s
20:35	34°12.7'S	097°14.8'W	36°45.0'S	097°09.4'W	35°27.5'S	097°13.7'W	26	209	03m59.4s
20:40	36°51.0'S	093°26.0'W	39°36.2'S	092°54.4'W	38°11.7'S	093°12.9'W	21	204	03m44.4s
20:45	40°16.5'S	088°13.0'W	43°32.5'S	086°39.3'W	41°50.5'S	087°33.0'W	15	197	03m25.7s
20:50	46°09.3'S	078°12.1'W	-	-	50°24.0'S	071°53.8'W	1	183	02m47.2s
Limits	50°07.6'S	070°19.6'W	51°35.5'S	071°33.7'W	50°51.4'S	070°55.8'W	0	183	02m45.4s

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center



**PHYSICAL EPHEMERIS OF THE UMBRAL SHADOW  
TOTAL SOLAR ECLIPSE OF 2010 JULY 11**

ΔT = 66.2 s

Universal Time	Central Line		Diameter	Eclipse	Sun	Sun	Path	Major	Minor	Umbra	Central
	Latitude	Longitude	Ratio	Obscur.	Alt °	Azm °	Width km	Axis km	Axis km	Veloc. km/s	Durat.
18:16.8	26°51.4'S	170°59.5'W	1.0441	1.0902	0.0	65.1	179.2	-	147.2	-	02m42.4s
18:20	22°19.8'S	159°27.6'W	1.0480	1.0982	12.0	59.8	197.0	761.8	159.4	3.160	03m15.1s
18:25	20°10.7'S	153°03.5'W	1.0502	1.1029	19.2	56.5	209.5	504.6	166.5	1.842	03m37.8s
18:30	18°57.0'S	148°42.5'W	1.0517	1.1062	24.2	53.9	219.2	416.3	171.4	1.385	03m55.0s
18:35	18°09.2'S	145°15.0'W	1.0529	1.1087	28.3	51.3	227.5	368.9	175.1	1.138	04m09.5s
18:40	17°37.6'S	142°19.0'W	1.0539	1.1107	31.7	48.8	234.8	338.7	178.1	0.980	04m22.1s
18:45	17°17.7'S	139°44.0'W	1.0547	1.1124	34.6	46.2	241.3	317.8	180.7	0.871	04m33.3s
18:50	17°07.1'S	137°24.2'W	1.0554	1.1139	37.1	43.5	247.0	302.5	182.9	0.791	04m43.1s
18:55	17°04.1'S	135°15.7'W	1.0560	1.1151	39.3	40.6	251.8	291.0	184.7	0.732	04m51.7s
19:00	17°07.7'S	133°15.9'W	1.0565	1.1162	41.2	37.6	255.7	282.1	186.2	0.687	04m59.1s
19:05	17°17.2'S	131°23.1'W	1.0569	1.1171	42.9	34.4	258.6	275.3	187.6	0.654	05m05.4s
19:10	17°31.9'S	129°35.6'W	1.0573	1.1178	44.2	31.0	260.7	270.0	188.6	0.629	05m10.5s
19:15	17°51.7'S	127°52.5'W	1.0575	1.1184	45.3	27.5	261.8	266.1	189.5	0.612	05m14.6s
19:20	18°16.1'S	126°12.6'W	1.0578	1.1188	46.2	23.9	262.0	263.2	190.2	0.602	05m17.5s
19:25	18°45.1'S	124°35.1'W	1.0579	1.1192	46.7	20.1	261.4	261.4	190.7	0.597	05m19.4s
19:30	19°18.6'S	122°59.4'W	1.0580	1.1194	47.1	16.3	260.0	260.5	191.0	0.597	05m20.3s
19:35	19°56.5'S	121°24.5'W	1.0580	1.1195	47.1	12.4	257.9	260.4	191.1	0.603	05m20.0s
19:40	20°38.9'S	119°49.9'W	1.0580	1.1194	46.9	8.4	255.3	261.3	191.0	0.613	05m18.8s
19:45	21°25.9'S	118°14.8'W	1.0579	1.1193	46.4	4.6	252.3	263.0	190.8	0.628	05m16.5s
19:50	22°17.7'S	116°38.5'W	1.0578	1.1190	45.7	0.7	248.8	265.6	190.3	0.649	05m13.3s
19:55	23°14.5'S	115°00.0'W	1.0576	1.1185	44.7	356.9	245.0	269.4	189.7	0.675	05m09.1s
20:00	24°16.8'S	113°18.4'W	1.0573	1.1180	43.4	353.2	241.1	274.4	188.9	0.707	05m03.9s
20:05	25°25.0'S	111°32.6'W	1.0570	1.1173	41.9	349.6	236.9	280.8	187.9	0.748	04m57.8s
20:10	26°39.9'S	109°41.0'W	1.0566	1.1164	40.1	346.1	232.7	289.2	186.6	0.798	04m50.7s
20:15	28°02.3'S	107°41.8'W	1.0561	1.1153	38.0	342.7	228.3	300.0	185.0	0.860	04m42.7s
20:20	29°33.7'S	105°32.3'W	1.0555	1.1141	35.5	339.3	223.8	314.1	183.2	0.939	04m33.7s
20:25	31°16.0'S	103°09.0'W	1.0548	1.1126	32.8	335.9	219.1	333.1	180.9	1.043	04m23.6s
20:30	33°12.2'S	100°26.0'W	1.0539	1.1108	29.6	332.5	214.3	359.8	178.2	1.186	04m12.3s
20:35	35°27.5'S	097°13.7'W	1.0529	1.1086	25.8	328.9	209.2	400.1	175.0	1.397	03m59.4s
20:40	38°11.7'S	093°12.9'W	1.0516	1.1058	21.2	324.8	203.6	469.3	170.8	1.754	03m44.4s
20:45	41°50.5'S	087°33.0'W	1.0497	1.1019	15.1	319.7	196.9	628.5	165.0	2.561	03m25.7s
20:50	50°24.0'S	071°53.8'W	1.0452	1.0925	0.8	307.2	183.5	9822.8	150.7	48.256	02m47.2s
20:50.0	50°51.4'S	070°55.8'W	1.0450	1.0920	0.0	306.5	182.8	-	149.9	-	02m45.4s

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center



TABLE 3.7  
LOCAL CIRCUMSTANCES FOR PACIFIC OCEAN & SOUTH AMERICA  
TOTAL SOLAR ECLIPSE OF 2010 JULY 11

Location Name	Latitude	Longitude	Elev.	First Contact			Second Contact			Third Contact			Fourth Contact			Maximum Eclipse			Eclips. Mag.	Eclips. Obs.	Urbal Depth												
				h	m	s	h	m	s	h	m	s	h	m	s	U.T.	P	V				h	m	s									
PACIFIC OCEAN																																	
COOK ISLANDS																																	
Manua Is.	21°55'S	157°55'W	—	17:15:06.8	276	30	1	18:19:27.3	105	226	18:22:45.4	269	30	19:26:50.8	98	230	8	38:21:06.0	7	128	14	59	1.048	1.003	0.856	0.818							
Manua Is.	20°09'S	157°23'W	—	17:13:46.5	274	26	1	—	—	—	—	—	—	19:38:05.4	101	251	29	38:29:57.8	187	308	15	59	0.988	0.991	—	—							
Kauai Is.	21°14'S	159°46'W	—	—	—	—	—	—	—	—	—	—	—	19:32:53.5	100	229	28	38:31:39.5	186	305	12	60	0.993	0.996	—	—							
FIJI																																	
Lautoka	17°37'S	177°27'W	—	—	—	—	—	—	—	—	—	—	—	19:01:53.4	116	227	4	38:43	81sec	—	—	0	67	0.260	0.178	—							
Suva	18°06'S	178°25'W	6	—	—	—	—	—	—	—	—	—	—	19:03:19.0	115	226	5	38:40	81sec	—	—	0	67	0.251	0.239	—							
FRENCH POLYNESIA																																	
Bora-Bora	16°30'S	151°45'W	—	17:13:51.2	272	23	7	—	—	—	—	—	—	19:43:56.2	105	238	37	38:53:24.0	188	307	22	57	0.941	0.937	—	—							
Moorea Is.	17°32'S	149°40'W	—	17:15:51.4	274	28	9	—	—	—	—	—	—	19:49:49.0	103	241	39	38:57:34.0	188	310	24	56	0.963	0.987	—	—							
Papeete, Tahiti	17°32'S	149°34'W	2	17:15:57.8	274	28	9	—	—	—	—	—	—	19:50:04.1	103	241	39	38:57:22.9	188	311	24	55	0.984	0.987	—	—							
Rikitea	23°08'S	138°57'W	—	17:39:10.0	289	58	23	—	—	—	—	—	—	20:33:32.3	100	270	44	39:02:09.3	191	319	30	38	0.887	0.869	—	—							
Hikueru	17°35'S	148°30'W	2	17:22:14.1	278	35	16	18:37:06.7	95	224	18:41:28.4	288	55	20:07:50.6	104	253	45	38:39:38.0	191	319	31	48	1.054	1.060	0.910	0.862							
Pitakoto	17°22'S	138°26'W	2	17:27:13.0	288	40	21	18:46:27.7	112	245	18:50:32.4	273	47	20:19:26.6	106	264	48	38:47:54.6	12	166	36	45	1.055	1.060	0.835	0.805							
SAMOA, WESTERN																																	
Apia	13°50'S	171°44'W	—	—	—	—	—	—	—	—	—	—	—	19:06:45.0	116	228	16	38:05:50.7	185	290	3	67	0.664	0.588	—	—							
TONGA																																	
Nukunono	21°08'S	175°12'W	—	—	—	—	—	—	—	—	—	—	—	19:12:35.6	106	224	11	38:59	81sec	—	—	0	67	0.708	0.716	—	—						
EASTER ISLAND (Isla de Pascua, Chile)																																	
Hanga Roa	27°05'S	109°56'W	—	18:40:35.9	293	181	40	20:08:30.0	129	322	20:13:10.9	282	116	21:34:16.3	116	330	32	20:10:50.6	25	219	40	346	1.056	1.003	0.767	0.861							
GALAPAGOS ISLANDS (ECUADOR)																																	
Isla Santa Cruz	00°38'S	89°23'W	—	20:07:57.9	321	47	53	—	—	—	—	—	—	20:39:40.7	198	62	46	30:23:55.4	209	90	50	306	0.620	0.003	—	—							
SOUTH AMERICA																																	
ARGENTINA																																	
Buenos Aires	34°38'S	058°27'W	27	20:13:43.8	288	128	7	—	—	—	—	—	—	—	—	—	—	20:57	38c	—	—	0	297	0.446	0.326	—							
Cordoba	31°24'S	065°11'W	—	20:11:52.8	288	128	13	—	—	—	—	—	—	—	—	—	—	21:04:11.5	204	78	4	299	0.438	0.328	—	—							
El Calafate	30°20'S	072°15'W	—	19:44:15.1	292	128	9	20:48:20.1	118	331	20:51:37.3	286	140	—	—	—	—	20:49:53.8	22	235	1	308	1.045	1.003	0.932	0.861							
La Plata	34°55'S	057°57'W	—	20:13:41.6	288	129	7	—	—	—	—	—	—	—	—	—	—	20:55	38c	—	—	0	297	0.437	0.327	—							
Lozano de Zamora	34°48'S	058°24'W	—	20:13:31.5	281	129	7	—	—	—	—	—	—	—	—	—	—	20:57	38c	—	—	0	297	0.448	0.338	—							
Mar del Plata	38°00'S	057°33'W	—	20:09:34.2	266	131	6	—	—	—	—	—	—	—	—	—	—	20:45	38c	—	—	0	298	0.452	0.343	—							
Mendoza	32°55'S	068°49'W	800	20:03:34.3	267	130	17	—	—	—	—	—	—	—	—	—	—	21:01:56.8	204	75	7	302	0.542	0.444	—	—							
Rosario	32°57'S	060°40'W	—	20:13:50.7	288	128	10	—	—	—	—	—	—	—	—	—	—	21:04:18.9	204	77	1	297	0.438	0.329	—	—							
San Miguel de la	26°49'S	065°13'W	—	20:17:46.1	252	124	16	—	—	—	—	—	—	—	—	—	—	21:04:26.8	205	82	7	299	0.319	0.209	—	—							
BOLIVIA																																	
La Paz	16°30'S	068°09'W	3658	20:39:13.3	228	108	20	—	—	—	—	—	—	21:22:52.5	186	73	10	21:01:53.3	206	91	15	299	0.061	0.038	—	—							
BRAZIL																																	
Sao Paulo	23°28'S	046°09'W	—	20:58:23.5	228	108	5	—	—	—	—	—	—	—	—	—	—	21:06:38.9	204	90	2	294	0.038	0.009	—	—							
Porto Alegre	30°04'S	051°11'W	10	20:29:31.6	243	120	2	—	—	—	—	—	—	—	—	—	—	20:39	38c	—	—	0	295	0.096	0.036	—	—						
CHILE																																	
Concepcion	36°50'S	073°03'W	—	19:53:54.7	377	133	18	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20:58:35.7	204	69	8	306	0.707	0.641	—	—		
Santiago	33°27'S	070°40'W	—	20:08:24.7	278	131	28	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21:08:51.8	205	74	8	303	0.583	0.492	—	—		
Valparaiso	33°02'S	071°38'W	41	19:59:27.8	278	130	39	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21:08:27.3	205	74	9	304	0.585	0.494	—	—		
PARAGUAY																																	
Asuncion	25°16'S	057°40'W	139	20:33:13.2	238	117	8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21:06:47.6	204	86	1	295	0.173	0.085	—	—		
PERU																																	
Lima	12°03'S	077°03'W	120	20:24:15.3	231	110	32	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	21:10:56.8	184	71	21	20:52:31.9	200	91	27	302	0.003	0.028
URUGUAY																																	
Montevideo	34°55'S	056°11'W	22	20:15:24.2	258	128	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	20:48	38c	—	—	0	297	0.388	0.256	—	—	

Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center

P1, Primo contatto : punto della Terra in cui l'eclisse inizia come parziale al sorgere del Sole  
P2, Secondo contatto : punto della Terra in cui l'eclisse finisce come parziale al sorgere del Sole  
P3, Terzo contatto : punto della Terra in cui l'eclisse inizia come parziale al tramonto del Sole  
P4, Quarto contatto : punto della Terra in cui l'eclisse finisce come parziale al tramonto del Sole

U1, Primo contatto : punto della Terra in cui l'eclisse inizia come totale al sorgere del Sole  
U2, Secondo contatto : punto della Terra in cui l'eclisse finisce come totale al sorgere del Sole  
U3, Terzo contatto : punto della Terra in cui l'eclisse inizia come totale al tramonto del Sole  
U4, Quarto contatto : punto della Terra in cui l'eclisse finisce come totale al tramonto del Sole

P1, first contact : point of the Earth in which the eclipse begins as partial at sunrising  
P2, second contact : point of the Earth in which the eclipse ends as partial at sunrising  
P3, Terzo contatto : point of the Earth in which the eclipse begins as partial at sunseting  
P4, Quarto contatto : point of the Earth in which the eclipse ends as partial at sunseting

U1, first contact : point of the Earth in which the eclipse begins as total at sunrising  
U2, second contact : point of the Earth in which the eclipse ends as total at sunrising  
U3, third contact : point of the Earth in which the eclipse begins as total at sunseting  
U4, fourth contact : point of the Earth in which the eclipse ends as total at sunseting

# Total Lunar Eclipse of 2010 Dec 21

Geocentric Conjunction = 08:13:36.0 UT J.D. = 2455551.84278

Greatest Eclipse = 08:16:55.9 UT J.D. = 2455551.84509

Penumbral Magnitude = 2.3064

P. Radius = 1.2673°

Gamma = 0.3213

Umbral Magnitude = 1.2614

U. Radius = 0.7145°

Axis = 0.3118°

Saros Series = 125 Member = 48 of 72

## Sun at Greatest Eclipse (Geocentric Coordinates)

R.A. = 17h57m09.5s

Dec. = -23°26'10.0"

S.D. = 00°16'15.5"

H.P. = 00°00'08.9"

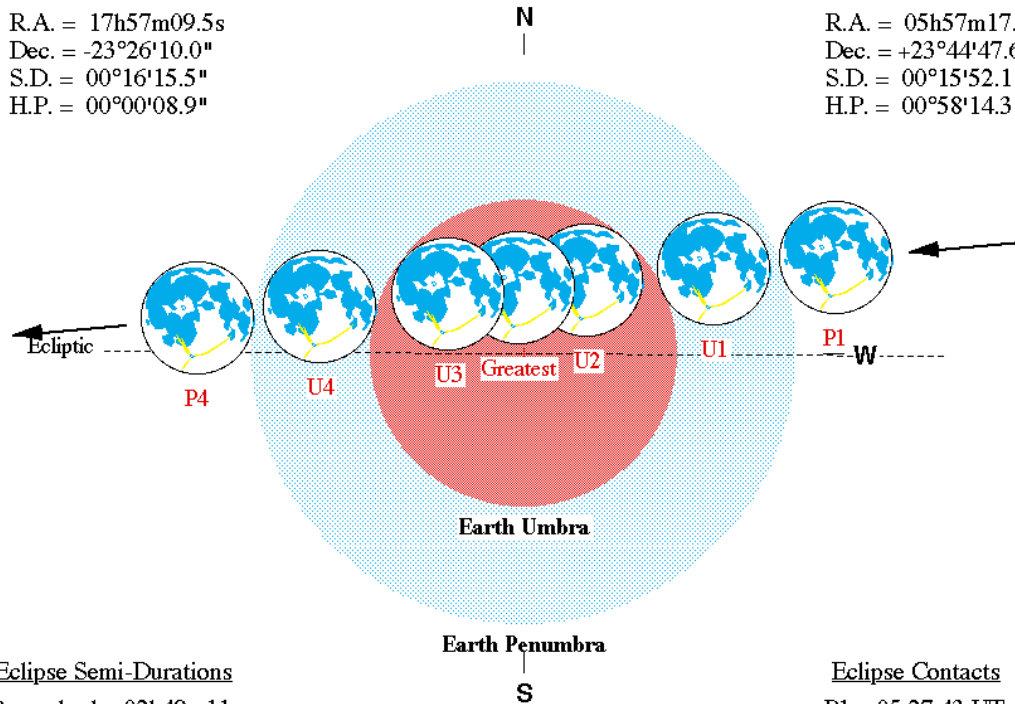
## Moon at Greatest Eclipse (Geocentric Coordinates)

R.A. = 05h57m17.2s

Dec. = +23°44'47.6"

S.D. = 00°15'52.1"

H.P. = 00°58'14.3"



## Eclipse Semi-Durations

Penumbral = 02h49m11s

Umbral = 01h44m41s

Total = 00h36m36s

Eph. = Newcomb/ILE

$\Delta T = 67.6$  s

F. Espenak, NASA's GSFC - 2004 Jul 07

<http://sunearth.gsfc.nasa.gov/eclipse/eclipse.html>

## Eclipse Contacts

P1 = 05:27:43 UT

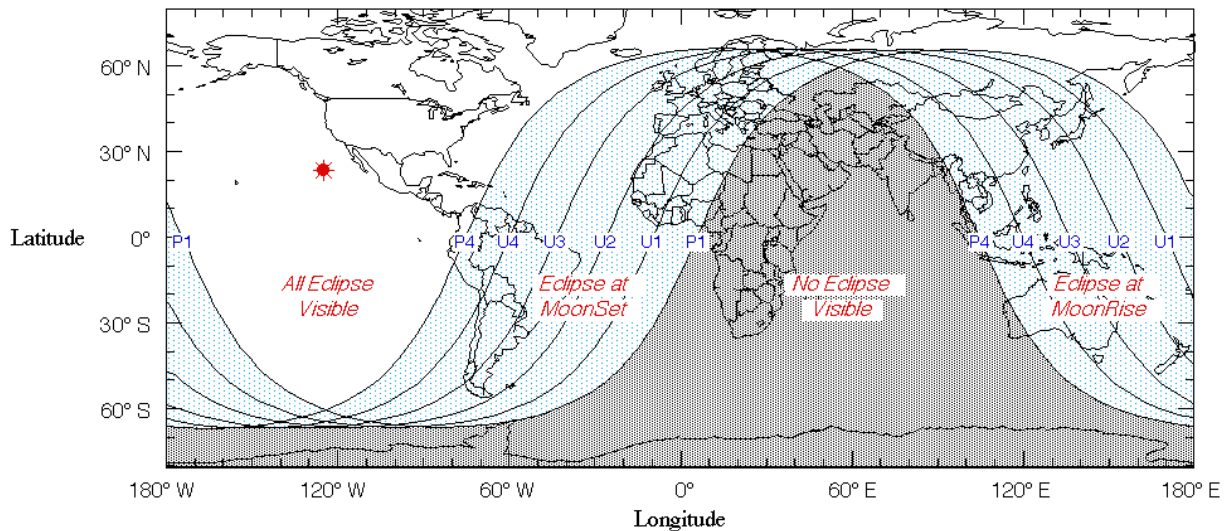
U1 = 06:32:17 UT

U2 = 07:40:21 UT

U3 = 08:53:34 UT

U4 = 10:01:39 UT

P4 = 11:06:04 UT



Eclipse map/figure/table/predictions courtesy of Fred Espenak, NASA/Goddard Space Flight Center

# SCIAMI METEORICI - METEOR SHOWERS

Shower	Activity	Max	$\lambda_{sol}$	$\alpha$	$\delta$	$v_{inf}$	$r$	ZHR
Antihelion Source (ANT)	Nov 26 - Sep 24					30	3.0	4
Quadrantids (QUA)	Jan 01 - Jan 05	Jan 03	283°16	230°	+49°	41	2.1	120
$\alpha$ -Centaurids (ACE)	Jan 28 - Feb 21	Feb 07	319°2	211°	-59°	56	2.0	5
$\delta$ -Leonids (DLE)	Feb 15 - Mar 10	Feb 25	336°	168°	+16°	23	3.0	2
$\gamma$ -Normids (GNO)	Feb 25 - Mar 22	Mar 13	353°	239°	-50°	56	2.4	4
Lyrids (LYR)	Apr 16 - Apr 25	Apr 22	32°32	271°	+34°	49	2.1	18
$\pi$ -Puppids (PPU)	Apr 15 - Apr 28	Apr 23	33°5	110°	-45°	18	2.0	Var
$\eta$ -Aquariids (ETA)	Apr 19 - May 28	May 06	45°5	338°	-01°	66	2.4	85(*)
$\eta$ -Lyrids (ELY)	May 03 - May 12	May 09	48°4	287°	+44°	44	3.0	3
June Bootids (JBO)	Jun 22 - Jul 02	Jun 27	95°7	224°	+48°	18	2.2	Var
Piscis Austrinids (PAU)	Jul 15 - Aug 10	Jul 28	125°	341°	-30°	35	3.2	5
South. $\delta$ -Aquariids (SDA)	Jul 12 - Aug 19	Jul 28	125°	339°	-16°	41	3.2	20
$\alpha$ -Capricornids (CAP)	Jul 03 - Aug 15	Jul 30	127°	307°	-10°	23	2.5	4
Perseids (PER)(*)	Jul 17 - Aug 24	Aug 12	140°0	48°	+58°	59	2.6	100
$\kappa$ -Cygids (KCG)	Aug 03 - Aug 25	Aug 17	145°	286°	+59°	25	3.0	3
$\alpha$ -Aurigids (AUR)	Aug 25 - Sep 08	Sep 01	158°6	84°	+42°	66	2.6	7
September Perseids (SPE)	Sep 05 - Sep 17	Sep 09	166°7	60°	+47°	64	2.9	5
$\delta$ -Aurigids (DAU)	Sep 18 - Oct 10	Sep 29	186°	82°	+49°	64	2.9	3
Draconids (DRA)	Oct 06 - Oct 10	Oct 08	195°4	262°	+54°	20	2.6	Var
$\varepsilon$ -Geminids (EGE)	Oct 14 - Oct 27	Oct 18	205°	102°	+27°	70	3.0	2
Orionids (ORI)	Oct 02 - Nov 07	Oct 21	208°	95°	+16°	66	2.5	30(*)
Leo Minorids (LMI)	Oct 19 - Oct 27	Oct 23	210°	161°	+38°	62	3.0	2
Southern Taurids (STA)	Sep 25 - Nov 25	Nov 05	223°	52°	+15°	27	2.3	5
Northern Taurids (NTA)	Sep 25 - Nov 25	Nov 12	230°	58°	+22°	29	2.3	5
Leonids (LEO)	Nov 10 - Nov 23	Nov 17	235°27	152°	+22°	71	2.5	100+(*)
$\alpha$ -Monocerotids (AMO)	Nov 15 - Nov 25	Nov 21	239°32	117°	+01°	65	2.4	Var
Dec Phoenicids (PHO)	Nov 28 - Dec 09	Dec 06	254°25	18°	-53°	18	2.8	Var
Puppids/Velids (PUP)	Dec 01 - Dec 15	(Dec 07)	(255°)	123°	-45°	40	2.9	10
Monocerotids (MON)	Nov 27 - Dec 17	Dec 09	257°	100°	+08°	42	3.0	2
$\sigma$ -Hydrids (HYD)	Dec 03 - Dec 15	Dec 12	260°	127°	+02°	58	3.0	3
Geminids (GEM)	Dec 07 - Dec 17	Dec 14	262°2	112°	+33°	35	2.6	120
Ursids (URS)	Dec 17 - Dec 26	Dec 22	270°7	217°	+76°	33	3.0	10
Coma Berenicids (CBE)	Dec 12 - Jan 23	Dec 30	278°	170°	+26°	65	3.0	5

\* Sciami con più picchi

\* An asterisk '\*' in the 'Shower' column indicates that source may have additional peak

Shower : sciame meteoric

Activity : period di attività

Max : data prevista del Massimo

**Quadrantidi:** max 12.50 T.U. del 3 gennaio, ZHR=120 con variabilità 60-200

La Luna crescente tramonterà verso la mezzanotte locale ed il radiante che è circumpolare raggiunge la sua massima altezza nella seconda parte della notte. Le osservazioni sono favorite prima dell'alba. Il picco è breve e fluttuante negli anni.

**Liridi:** max 11 T.U. del 22 aprile, ZHR 18 variabile fino a 90

Il picco può variare tra le 3 e le 14 T.U., con attività pure variabile. La sua durata è di poche ore. Si consiglia di osservare dopo le 22.30 locali. La Luna crescente tramonterà tardi nella notte.

**Eta Puppidi:** max 16 T.U. del 23 aprile, ZHR fino a 140

Sono legate alla cometa 26P/Grigg-skjellerup, passata al perielio nel marzo 2008. La Luna sarà nuova.

**Eta Aquaridi:** max 0 T.U. del 6 maggio, ZHR 85 variabile tra 40 e 85

Sono associate alla cometa 1P/Halley. Le meteore sono spesso veloci e brillanti, con lunghe scie persistenti. In base ai dati rilevati negli ultimi anni (1984-201) vi sono buone possibilità che un massimo cada quest'anno o il prossimo.

**Bootidi di giugno:** max 8.30 T.U. del 27 giugno, ZHR variabile da 0 a 100

Sono legate alla cometa 7P/Pons-winnecke, passata al perielio nel settembre 2008. Il radiante è ben messo al calar della Luna.

**Perseidi:** max 17.30-20 T.U. del 12 agosto, ZHR variabile da 10 in su

La Luna disturberà completamente le osservazioni essendo all'ultimo quarto. Potrebbe esserci un massimo secondario alle 9 T.U. del 12 agosto.

**Draconidi:** max 16.40 T.U. dell'8 ottobre, ZHR variabile fino alla tempesta di meteore

Parenti della cometa 26P/Giacobini-Zinner sono famose per le piogge del 1946 e 1993. Il radiante è circumpolare e raggiunge la sua massima altezza nella prima parte della notte. La Luna calante disturberà le osservazioni nella seconda parte. Sono meteore lentissime.

**Orionidi:** max il 21 ottobre, ZHR 30

Il radiante è ben osservabile intorno a mezzanotte, con la Luna nuova.

**Leonidi:** max 15.10 T.U. del 18 novembre, ZHR 100 o maggiore fino alla tempesta di meteore

Sono legate alla cometa 55P/Tempel-Tuttle. Secondo alcuni studi potrebbe esserci una buona attività anche quest'anno. Un picco secondario potrebbe avvenire tra le 20.40 e le 22 T.U. del giorno 17.

**Alfa Monocerotidi:** max 15.25 T.U. del 21 novembre, ZHR 5, talora oltre 400

Da tenere sotto controllo.

**Geminidi:** max 5.10 T.U. del 14 dicembre, ZHR 120

Ottima visibilità visto che la Luna è nuova. Il radiante culmina alle 2 ora locale.

**Ursidi:** max 13.30 T.U. del 22 dicembre, ZHR 10, occasionalmente fino a 50

Sembrano correlate alla cometa 8P/tuttle, passata al perielio nel gennaio 2008. Vi sono stati negli anni recenti molti picchi. La Luna crescente causerà qualche disturbo alle osservazioni.

# VISIBILITA' DEI RADIANTI

## VISIBILITY OF THE SHOWERS

Roma : 42 N, 12 E (UT)

Oggetto: Quadrantidi

Data	Ora	Alt	Az	Sole	Luna
2010:01:04	16:00	12.2	327.5	Crep.c	Sopra
2010:01:04	17:00	6.9	336.0	Crep.a	Sopra
2010:01:04	18:00	3.1	345.1	Notte	Sopra
2010:01:04	19:00	1.2	354.8	Notte	Sopra
2010:01:04	20:00	1.1	4.6	Notte	Sopra
2010:01:04	21:00	2.9	14.3	Notte	Sopra
2010:01:04	22:00	6.6	23.5	Notte	Sopra
2010:01:04	23:00	11.8	32.0	Notte	Sopra
2010:01:05	00:00	18.3	39.6	Notte	Sopra
2010:01:05	01:00	26.0	46.3	Notte	Sotto
2010:01:05	02:00	34.5	52.1	Notte	Sotto
2010:01:05	03:00	43.6	56.9	Notte	Sotto
2010:01:05	04:00	53.2	60.4	Notte	Sotto
2010:01:05	05:00	63.0	61.8	Crep.a	Sotto
2010:01:05	06:00	72.7	58.0	Crep.n	Sotto
2010:01:05	07:00	81.2	33.8	Giorno	Sotto

Oggetto: Liridi

Data	Ora	Alt	Az	Sole	Luna
2010:04:22	16:00	-13.1	11.3	Giorno	Sotto
2010:04:22	17:00	-9.8	23.6	Giorno	Sotto
2010:04:22	18:00	-4.3	34.9	Crep.c	Sotto
2010:04:22	19:00	2.9	45.0	Crep.n	Sotto
2010:04:22	20:00	11.4	54.2	Notte	Sotto
2010:04:22	21:00	21.0	62.6	Notte	Sotto
2010:04:22	22:00	31.2	70.4	Notte	Sotto
2010:04:22	23:00	42.0	78.3	Notte	Sotto
2010:04:23	00:00	53.1	86.7	Notte	Sotto
2010:04:23	01:00	64.3	97.5	Notte	Sotto
2010:04:23	02:00	75.0	116.4	Notte	Sotto
2010:04:23	03:00	82.1	172.7	Crep.a	Sopra
2010:04:23	04:00	76.6	238.6	Crep.c	Sopra
2010:04:23	05:00	66.0	260.3	Giorno	Sopra
2010:04:23	06:00	54.9	271.8	Giorno	Sopra
2010:04:23	07:00	43.8	280.4	Giorno	Sopra

Oggetto: Perseidi

Data	Ora	Alt	Az	Sole	Luna
2010:08:12	16:00	10.3	354.0	Giorno	Sotto
2010:08:12	17:00	9.9	2.0	Giorno	Sotto
2010:08:12	18:00	11.1	10.0	Giorno	Sotto
2010:08:12	19:00	13.8	17.7	Crep.n	Sotto
2010:08:12	20:00	17.9	24.8	Crep.a	Sotto
2010:08:12	21:00	23.1	31.2	Notte	Sopra

2010:08:12	22:00	29.4	36.7	Notte	Sopra
2010:08:12	23:00	36.4	41.1	Notte	Sopra
2010:08:13	00:00	44.0	44.2	Notte	Sopra
2010:08:13	01:00	51.9	45.4	Notte	Sopra
2010:08:13	02:00	59.8	43.6	Notte	Sopra
2010:08:13	03:00	67.1	36.4	Crep.a	Sopra
2010:08:13	04:00	72.5	19.2	Crep.c	Sopra
2010:08:13	05:00	73.7	351.9	Giorno	Sopra
2010:08:13	06:00	69.8	329.5	Giorno	Sopra
2010:08:13	07:00	63.1	318.6	Giorno	Sopra

Oggetto: Leonidi

Data	Ora	Alt	Az	Sole	Luna
2010:11:17	16:00	-23.3	339.1	Crep.c	Sotto
2010:11:17	17:00	-25.9	354.2	Crep.a	Sotto
2010:11:17	18:00	-25.5	9.7	Notte	Sotto
2010:11:17	19:00	-22.2	24.5	Notte	Sotto
2010:11:17	20:00	-16.4	37.9	Notte	Sotto
2010:11:17	21:00	-8.6	49.8	Notte	Sotto
2010:11:17	22:00	0.5	60.3	Notte	Sotto
2010:11:17	23:00	10.7	70.0	Notte	Sotto
2010:11:18	00:00	21.5	79.2	Notte	Sotto
2010:11:18	01:00	32.6	88.6	Notte	Sotto
2010:11:18	02:00	43.7	99.3	Notte	Sotto
2010:11:18	03:00	54.5	113.0	Notte	Sotto
2010:11:18	04:00	63.9	133.4	Notte	Sotto
2010:11:18	05:00	69.7	166.2	Crep.n	Sotto
2010:11:18	06:00	68.4	205.8	Crep.c	Sotto
2010:11:18	07:00	61.2	234.2	Giorno	Sotto

Oggetto: Geminidi

Data	Ora	Alt	Az	Sole	Luna
2010:12:13	16:00	-5.6	34.7	Crep.c	Sotto
2010:12:13	17:00	1.6	45.0	Crep.a	Sotto
2010:12:13	18:00	10.2	54.4	Notte	Sotto
2010:12:13	19:00	19.7	62.9	Notte	Sotto
2010:12:13	20:00	30.0	70.9	Notte	Sotto
2010:12:13	21:00	40.8	78.9	Notte	Sotto
2010:12:13	22:00	51.9	87.6	Notte	Sotto
2010:12:13	23:00	63.1	98.6	Notte	Sotto
2010:12:14	00:00	73.8	117.5	Notte	Sotto
2010:12:14	01:00	81.0	168.4	Notte	Sotto
2010:12:14	02:00	76.5	233.1	Notte	Sotto
2010:12:14	03:00	66.3	257.2	Notte	Sotto
2010:12:14	04:00	55.1	269.6	Notte	Sotto
2010:12:14	05:00	44.0	278.7	Crep.a	Sopra
2010:12:14	06:00	33.1	286.8	Crep.c	Sopra
2010:12:14	07:00	22.6	294.8	Giorno	Sopra

Data, ora, altezza ed azimut dei principali radianti; posizione del Sole (giorno, crepuscolo civile, crepuscolo nautico, crepuscolo astronomico, notte); Luna (sopra o sotto l'orizzonte)

Date, times, height and azimuth of some radiants; position of the Sun (giorno=day, crep.c.=civil twilight, crep.n.=nautical twilight, crep.a.=astronomical twilight, notte=night); Moon (sopra=up or sotto=down the horizon)

# TABELLA DI CONVERSIONE MAGNITUDINE ASSOLUTA

## TABLE OF CONVERSION OF ABSOLUTE MAGNITUDE

UA-H	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
0,001	918,09	579,28	365,50	230,62	145,51	91,81	57,93	36,55	23,06	14,55	9,18	5,79	3,66	2,31	1,46	0,92	0,58	0,37
0,005	183,62	115,86	73,10	46,12	29,10	18,36	11,59	7,31	4,61	2,91	1,84	1,16	0,73	0,46	0,29	0,18	0,12	0,07
0,01	91,81	57,93	36,55	23,06	14,55	9,18	5,79	3,66	2,31	1,46	0,92	0,58	0,37	0,23	0,15	0,09	0,06	0,04
0,05	18,36	11,59	7,31	4,61	2,91	1,84	1,16	0,73	0,46	0,29	0,18	0,12	0,07	0,05	0,03	0,02	0,01	0,01
0,1	9,18	5,79	3,66	2,31	1,46	0,92	0,58	0,37	0,23	0,15	0,09	0,06	0,04	0,02	0,01	0,01	0,01	0,00
0,2	4,59	2,90	1,83	1,15	0,73	0,46	0,29	0,18	0,12	0,07	0,05	0,03	0,02	0,01	0,01	0,00	0,00	0,00
0,3	3,06	1,93	1,22	0,77	0,49	0,31	0,19	0,12	0,08	0,05	0,03	0,02	0,01	0,01	0,00	0,00	0,00	0,00
0,4	2,30	1,45	0,91	0,58	0,36	0,23	0,14	0,09	0,06	0,04	0,02	0,01	0,01	0,01	0,00	0,00	0,00	0,00
0,5	1,84	1,16	0,73	0,46	0,29	0,18	0,12	0,07	0,05	0,03	0,02	0,01	0,01	0,00	0,00	0,00	0,00	0,00
0,6	1,53	0,97	0,61	0,38	0,24	0,15	0,10	0,06	0,04	0,02	0,02	0,01	0,01	0,00	0,00	0,00	0,00	0,00
0,7	1,31	0,83	0,52	0,33	0,21	0,13	0,08	0,05	0,03	0,02	0,01	0,01	0,01	0,00	0,00	0,00	0,00	0,00
0,8	1,15	0,72	0,46	0,29	0,18	0,11	0,07	0,05	0,03	0,02	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00
0,9	1,02	0,64	0,41	0,26	0,16	0,10	0,06	0,04	0,03	0,02	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00
1	0,92	0,58	0,37	0,23	0,15	0,09	0,06	0,04	0,02	0,01	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00
1,5	0,61	0,39	0,24	0,15	0,10	0,06	0,04	0,02	0,02	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00
2	0,46	0,29	0,18	0,12	0,07	0,05	0,03	0,02	0,01	0,01	0,00	0,00	0,00	0,00	0,00	0,00	0,00	0,00

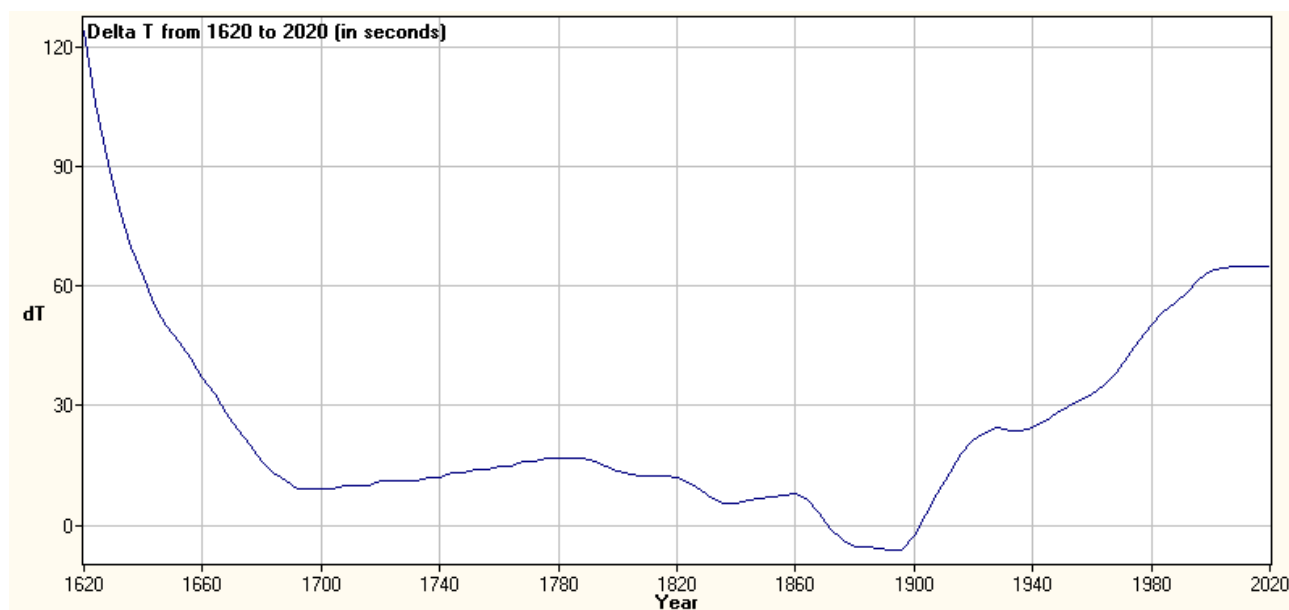
Utilizzo: conoscendo la magnitudine assoluta di un asteroide (H) e la sua distanza dalla Terra (UA) la tabella fornisce il diametro minimo del corpo in secondi d'arco.

Esempio: un asteroide con H=4 che si trovi a 0.05 U.A. dalla Terra avrà una dimensione minima di circa 11.6" d'arco. La dimensione massima è pari a circa il doppio.

How to use: knowing the absolute magnitude of an asteroid (H) and its distance from the Earth (UA) the chart furnishes the least diameter of the body in seconds of arc.

## ΔT DIFFERENZA TDT-UT

## ΔT DIFFERENCE TDT-UT



Differenza in secondi tra il Tempo Dinamico Terrestre ed il Tempo Universale, utile al fine di calcolare gli istanti geocentrici e topocentrici dei fenomeni celesti

Difference in second between Terrestrial Dynamical Time and the Universal Time, useful with the purpose to calculate the instants of the geocentric and topocentric celestial phenomena

# CORREZIONI DELL'ISTANTE DEL SORGERE E TRAMONTARE DEL SOLE, DELLA LUNA E DEI PIANETI PER LATITUDINI DIVERSE DA 42° CORRECTION OF RISING AND SETTING OF THE SUN, THE MOON AND THE PLANETS FOR LATITUDE DIFFERENT FROM 42°

	36	37	38	39	40	41	42	43	44	45	46	47	48
30	29	25	20	15	10	5	0	-5	-10	-16	-22	-28	-34
29	27	23	19	14	10	5	0	-5	-10	-15	-21	-27	-33
28	25	21	17	13	9	4	0	-5	-10	-15	-20	-25	-31
27	24	20	16	12	8	4	0	-5	-9	-14	-19	-24	-29
26	22	19	15	11	7	4	0	-5	-9	-13	-18	-23	-28
25	21	18	14	11	7	3	0	-4	-8	-13	-17	-21	-26
24	20	17	13	10	7	3	0	-4	-8	-12	-16	-20	-25
23	19	16	13	10	6	3	0	-4	-7	-11	-15	-19	-23
22	18	15	12	9	6	3	0	-3	-7	-10	-14	-18	-22
21	17	14	11	9	6	3	0	-3	-6	-10	-13	-17	-20
20	16	13	11	8	6	3	0	-3	-6	-9	-12	-15	-19
19	15	13	11	8	6	3	0	-2	-5	-8	-11	-14	-17
18	14	11	9	7	5	2	0	-3	-5	-8	-11	-14	-17
17	13	11	9	7	5	2	0	-2	-5	-7	-10	-13	-16
16	12	10	9	7	5	2	0	-2	-4	-7	-9	-12	-14
15	11	9	7	5	4	2	0	-2	-5	-7	-9	-11	-14
14	10	9	7	5	4	2	0	-2	-4	-6	-8	-10	-12
13	10	8	7	5	4	2	0	-1	-3	-5	-7	-9	-11
12	9	7	6	4	3	1	0	-2	-4	-5	-7	-9	-11
11	8	7	6	4	3	2	0	-1	-3	-4	-6	-8	-9
10	7	6	4	3	2	1	0	-2	-3	-5	-6	-8	-9
9	6	5	4	3	2	1	0	-1	-2	-4	-5	-6	-8
8	6	5	4	3	2	1	0	-1	-2	-3	-4	-5	-6
7	5	4	3	2	2	1	0	-1	-2	-3	-4	-5	-6
6	5	4	3	2	2	1	0	-1	-1	-2	-3	-4	-5
5	3	3	2	2	1	0	0	-1	-2	-2	-3	-4	-5
4	3	3	2	2	1	1	0	0	-1	-1	-2	-3	-3
3	2	1	1	1	0	0	0	-1	-1	-2	-2	-2	-3
2	1	1	1	1	1	0	0	0	0	-1	-1	-1	-2
1	0	0	0	0	0	0	0	-1	-1	-1	-1	-1	-1
0	0	0	0	0	0	0	0	0	0	0	0	0	0
-1	0	0	0	0	0	0	0	1	1	1	1	1	1
-2	-1	-1	-1	-1	-1	0	0	0	0	1	1	1	2
-3	-2	-1	-1	-1	0	0	0	1	1	2	2	2	3
-4	-3	-3	-2	-2	-1	-1	0	0	1	1	2	3	3
-5	-3	-3	-2	-2	-1	0	0	1	2	2	3	4	5
-6	-5	-4	-3	-2	-2	-1	0	1	1	2	3	4	5
-7	-5	-4	-3	-2	-2	-1	0	1	2	3	4	5	6
-8	-6	-5	-4	-3	-2	-1	0	1	2	3	4	5	6
-9	-6	-5	-4	-3	-2	-1	0	1	2	4	5	6	8
-10	-7	-6	-4	-3	-2	-1	0	2	3	5	6	8	9
-11	-8	-7	-6	-4	-3	-2	0	1	3	4	6	8	9
-12	-9	-7	-6	-4	-3	-1	0	2	4	5	7	9	11
-13	-10	-8	-7	-5	-4	-2	0	1	3	5	7	9	11
-14	-10	-9	-7	-5	-4	-2	0	2	4	6	8	10	12
-15	-11	-9	-7	-5	-4	-2	0	2	5	7	9	11	14
-16	-12	-10	-9	-7	-5	-2	0	2	4	7	9	12	14
-17	-13	-11	-9	-7	-5	-2	0	2	5	7	10	13	16
-18	-14	-11	-9	-7	-5	-2	0	3	5	8	11	14	17
-19	-15	-13	-11	-8	-6	-3	0	2	5	8	11	14	17
-20	-16	-13	-11	-8	-6	-3	0	3	6	9	12	15	19
-21	-17	-14	-11	-9	-6	-3	0	3	6	10	13	17	20
-22	-18	-15	-12	-9	-6	-3	0	3	7	10	14	18	22
-23	-19	-16	-13	-10	-6	-3	0	4	7	11	15	19	23
-24	-20	-17	-13	-10	-7	-3	0	4	8	12	16	20	25
-25	-21	-18	-14	-11	-7	-3	0	4	8	13	17	21	26
-26	-22	-19	-15	-11	-7	-4	0	5	9	13	18	23	28
-27	-24	-20	-16	-12	-8	-4	0	5	9	14	19	24	29
-28	-25	-21	-17	-13	-9	-4	0	5	10	15	20	25	31
-29	-27	-23	-19	-14	-10	-5	0	5	10	15	21	27	33
-30	-29	-25	-20	-15	-10	-5	0	5	10	16	22	28	34

I valori sono espressi in minuti di tempo e vanno presi con il segno indicato per il sorgere dell'oggetto, e col segno opposto per il tramonto.

In alto sono indicati i valori della latitudine, a sinistra i valori della declinazione.

Vanno aggiunti anche 4 minuti ogni grado di longitudine più verso ovest rispetto ai 12° di tutte le tabelle dell'almanacco. Sottratti se verso est.

Esempio : 01/01/2009, declinazione del Sole - 23° circa. Esso sorge a Roma (42°N) alle 07.40 e tramonta alle 16.51. Per un luogo alla stessa longitudine, ma a 46° N, il Sole sorge alle 07.40+ 15 minuti =7.55 e tramonta alle 16.51- 15 minuti =16.36 circa.

The values are express in minutes of time and must be taken with the suitable sign for rising, and with the opposite sign for the sunsetting.

Aloft are suitable the values of the latitude, to the left the values of the declination. They must also be added 4 minutes every degree of longitude toward west in comparison to the 12° of all the charts of the almanac.

Subtracted if toward east.



## ORIZZONTE REALE - REAL HORIZON

E' la distanza dell'orizzonte visibile da un osservatore in una giornata perfettamente limpida, trascurando la rifrazione atmosferica.

It is the distance of the visible horizon from an observer in a perfectly clear day, neglecting the atmospheric refraction.

h (m)	km
0	0,0
1	3,6
2	5,0
3	6,2
4	7,1
5	8,0
6	8,7
7	9,4
8	10,1
9	10,7
10	11,3
20	16,0

30	19,6
40	22,6
50	25,2
60	27,7
70	29,9
80	31,9
90	33,9
100	35,7
200	50,5
300	61,8
400	71,4
500	79,8
600	87,4

700	94,5
800	101,0
900	107,1
1000	112,9
1100	118,4
1200	123,7
1300	128,7
1400	133,6
1500	138,3
1600	142,8
1700	147,2
1800	151,5
1900	155,6

2000	159,7
2100	163,6
2200	167,4
2300	171,2
2400	174,9
2500	178,5
2600	182,0
2700	185,5
2800	188,9
2900	192,3

H è l'altezza a cui ci si trova sul livello del mare, in metri  
Esempio, da quota 1600 metri l'orizzonte si estende per 143 km circa.

## RIFRAZIONE - REFRACTION

Angolo in gradi Angle in degrees	Errore in primi Error in primi	Angolo in gradi Angle in degrees	Errore in primi Error in primi
0	34.5	11	4.9
15'	31.4	12	4.5
30'	28.7	13	4.1
45'	26.4	14	3.8
1.00	24.3	15	3.6
1.15	22.5	16	3.3
1.30	20.9	17	3.1
1.45	19.5	18	2.9
2.00	18.3	19	2.8
2.15	17.2	20	2.6
2.30	16.1	25	2.1
2.45	15.2	30	1.7
3.00	14.4	35	1.4
4.30	10.7	50	0.8
5	9.9	55	0.7
6	8.5	60	0.6
7	7.4	65	0.5
8	6.6	70	0.4
9	5.9	80	0.2
10	5.3	90	0.0

# COORDINATE DI ALCUNE CITTA' ITALIANE

## ITALIAN LOCALITIES COORDINATES

Località	Longitudine	Latitudine	Altezza	Località	Longitudine	Latitudine	Altezza
AGRIGENTO	13 36	37 17	230	MESSINA	15 34	38 11	3
ALESSANDRIA	8 36	44 54	95	MILANO	9 11	45 27	122
ANCONA	13 30	43 37	16	MODENA	10 53	44 38	34
AOSTA	7 19	45 44	583	NAPOLI	14 15	40 51	115
AREZZO	11 53	43 27	296	NOVARA	8 37	45 26	159
ASCOLI PICENO	13 34	42 51	154	NUORO	9 20	40 19	532
ASTI	8 12	44 54	123	ORISTANO	8 36	39 54	3
AVELLINO	14 47	40 54	348	PADOVA	11 52	45 24	38
BARI	16 52	41 07	5	PALERMO	13 22	38 08	23
BELLUNO	12 13	46 08	383	PARMA	10 20	44 48	55
BENEVENTO	14 46	41 07	135	PAVIA	9 09	45 11	77
BERGAMO	9 39	45 42	249	PERUGIA	12 23	43 06	493
BOLOGNA	11 21	44 29	84	PESARO	12 54	43 54	11
BOLZANO	11 21	46 29	262	PESCARA	14 12	42 27	4
BRESCIA	10 13	45 32	149	PIACENZA	9 41	45 03	80
BRINDISI	17 46	40 39	15	PISA	10 23	43 43	4
CAGLIARI	9 07	39 13	4	PISTOIA	10 55	43 55	65
CALTANISSETTA	14 03	37 28	568	PORDENONE	12 38	45 57	0
CAMPOBASSO	14 39	41 33	786	POTENZA	15 48	40 38	820
CASERTA	14 19	41 04	68	RAGUSA	14 45	36 56	502
CATANIA	15 05	37 30	47	RAVENNA	12 12	44 25	4
CATANZARO	16 35	38 54	343	REGGIO CALABRIA	15 38	38 06	15
CHIETI	14 10	42 21	330	REGGIO EMILIA	10 37	44 41	58
COMO	9 15	45 47	201	RIETI	12 51	42 24	406
COSENZA	16 15	39 17	238	ROMA	12 27	41 55	143
CREMONA	10 01	45 08	45	ROVERETO	11 03	45 54	220
CUNEO	7 33	44 23	534	ROVIGO	11 47	45 04	7
ENNA	14 17	37 32	931	SALERNO	14 45	40 40	4
FERRARA	11 35	44 50	9	SASSARI	8 33	40 43	225
FIRENZE	11 15	43 45	184	SAVONA	8 29	44 18	4
FOGGIA	15 32	41 27	72	SIENA	11 20	43 19	322
FORLI`	12 02	44 13	34	SIRACUSA	15 18	37 03	17
FROSINONE	13 21	41 38	291	SONDRIO	9 52	46 10	307
GENOVA	8 55	44 25	108	TARANTO	17 13	40 28	15
GORIZIA	13 37	45 56	84	TERAMO	13 44	42 39	398
GROSSETO	11 06	42 45	10	TERNI	12 38	42 33	130
IMPERIA	8 01	43 52	22	TORINO	7 41	45 04	239
ISERNIA	14 15	41 24	0	TRAPANI	12 30	38 01	3
L'AQUILA	13 24	42 21	714	TRENTO	11 07	46 03	194
LA SPEZIA	9 49	44 05	3	TREVISI	12 14	45 39	15
LATINA	12 54	41 27	21	TRIESTE	13 45	45 38	67
LECCE	18 10	40 21	49	UDINE	13 14	46 03	113
LIVORNO	10 18	43 31	3	VARESE	8 48	45 00	000
LUCCA	10 30	43 50	327	VENEZIA	12 20	45 26	1
MACERATA	13 25	43 17	314	VERCELLI	8 25	45 19	130
MANTOVA	10 47	45 09	19	VERONA	10 59	45 26	59
MASSA	10 08	44 01	65	VICENZA	11 32	45 32	39
MATERA	16 36	40 39	399	VITERBO	12 06	42 24	325

Longitudine Est e Latitudine Nord

# POTERE RISOLUTIVO DELL'OCCHIO

## RESOLUTION POWER OF THE EYE

Potere risolutivo dell'occhio nudo in funzione della magnitudine visuale delle due stelle "osservate".

mag1	mag2	p"	mag1	mag2	p"
-3.0	-3.0	1910.18	0.0	0.0	480.56
-3.0	-2.0	1558.02	0.0	1.0	391.96
-3.0	-1.0	1335.71	0.0	2.0	336.04
-3.0	0.0	1195.37	0.0	3.0	300.73
-3.0	1.0	1106.77	0.0	4.0	278.44
-3.0	2.0	1050.85	0.0	5.0	264.37
-3.0	3.0	1015.54	0.0	6.0	255.49
-3.0	4.0	993.25			
-3.0	5.0	979.18	1.0	1.0	303.37
-3.0	6.0	970.30	1.0	2.0	247.44
			1.0	3.0	212.13
-2.0	-2.0	1205.86	1.0	4.0	189.85
-2.0	-1.0	983.55	1.0	5.0	175.78
-2.0	0.0	843.21	1.0	6.0	166.89
-2.0	1.0	754.62			
-2.0	2.0	698.69	2.0	2.0	191.51
-2.0	3.0	663.38	2.0	3.0	156.21
-2.0	4.0	641.09	2.0	4.0	133.92
-2.0	5.0	627.02	2.0	5.0	119.85
-2.0	6.0	618.14	2.0	6.0	110.96
-1.0	-1.0	761.24	3.0	3.0	120.90
-1.0	0.0	620.90	3.0	4.0	98.61
-1.0	1.0	532.31	3.0	5.0	84.54
-1.0	2.0	476.38	3.0	6.0	75.66
-1.0	3.0	441.07			
-1.0	4.0	418.78	4.0	4.0	76.32
-1.0	5.0	404.71	4.0	5.0	62.25
-1.0	6.0	395.83	4.0	6.0	53.37
			5.0	5.0	48.18
			5.0	6.0	39.30
			6.0	6.0	30.42

Prese due stelle o oggetti di magnitudine mag1 e mag2, se la loro distanza angolare è minore del valore p indicato, l'occhio le vedrà come un oggetto unico

# ELENCO DELLE STELLE CON MAGNITUDINE < 5

## STARS WITH MAGNITUDE < 5

-1.5	Alpha	CMA	Sirius	2.6	Kappa	VEL	Markeb	3.1	Gamma	PER	3.5	Epsilon	HYA	
-0.8	Alpha	CAR	Canopus	2.6	Gammal	LEO	Algieba	3.1	Delta	PER	3.5	Lambda	UMA Tania Bor.	
0.0	Alpha1	CEN		2.6	Delta	LEO	Zosma	3.1	PUP	L2 (v)	3.5	Beta	PAV	
Rigil	Kentaur			2.6	Alpha	PEG	Markab	3.1	Beta	CMI	Gomeisa	3.5	Beta	LYR Sheliak
0.1	Alpha	LYR	Vega	2.6	Beta	PEG	Scheat	3.1	Iota	UMA	Talitha	3.5	Mu	HER
0.2	Beta	ORI	Rigel	2.6	Alpha	CEP	Alderamin	3.1	Epsilon	LEO	Asad Austr.	3.5	Gamma	ARA
0.2	Alpha	AUR	Capella	2.6	Epsilon	CYG	Gienah	3.1	Psi	UMA		3.5	Alpha1	HER Rasalgethi
0.2	Alpha	BOO	Arcturus	2.6	Eta	OPH	Sabik	3.1	Eta	PEG	Matar	3.5	Iota	DRA Edasich
0.5	Alpha	CMI	Procyon	2.6	Zeta	OPH	Han	3.1	Gamma	GRU		3.5	Delta	BOO
0.6	Alpha	ERI	Achernar	2.6	Beta	LIB		3.1	Zeta	ARA		3.5	Nu	CEN
0.6	Alpha	ORI	Betelgeuse	Zubeneschamali				3.1	Mul	SCO		3.6	Eta	CAS Achird
0.8	Beta	CEN		2.6	Alpha	LUP	Men	3.1	Gamma	UMI	Pherkad	3.6	Tau	CET
Hadar	(Agena)			2.7	Beta	ARI	Sheratan	3.1	Epsilon	CRV		3.6	Alpha	TRI
0.9	Alpha	AQL	Altair	2.7	Alpha	COL	Phact	3.2	Gamma	HYI		Rasalmothal.		
1.0	Alpha	SCO	Antares	2.7	Theta	AUR		3.2	Epsilon	LEP		3.6	Gamma	CET
1.1	Alpha	TAU	Aldebaran	2.7	Pi	PUP		3.2	Beta	COL	Wazn	Alkaffaljid.		
1.1	Alpha	VIR	Spica	2.7	Zeta	SGR	Ascella	3.2	Mu	GEM	Tejat	3.6	Delta	ERI Rana
1.2	Beta	GEM	Pollux	2.7	Betal	SCO	Graffias	3.2	Nu	PUP		3.6	Upsilon4	ERI
1.2	Alpha	PSA	Fomalhaut	2.7	Beta	CRV	Kraz	3.2	Epsilon	GEM	Mebstuta	3.6	Epsilon	TAU Ain
1.3	Alpha	LEO	Regulus	2.7	Gamma	CRV	Minkar	3.2	Mu	UMA	Tania	3.6	Theta2	TAU
1.3	Alpha	CYG	Deneb	2.8	Beta	HYI		Austr.				3.6	Tau	ORI
1.4	Alpha2	CEN		2.8	Gamma	CAS	Cih	3.2	Nu	HYA		3.6	Beta	DOR
1.4	Beta	CRU	Mimosa	2.8	Delta	CAS	Ruchbah	3.2	Lambda	CEN		3.6	Zeta	LEP
1.4	Alpha1	CRU	Acrux	2.8	Alpha	CET	Menkar	3.2	Alpha	AQR	Sadalmelik	3.6	Theta	GEM
1.6	Epsilon	CMA	Adhara	2.8	Beta	ERI	Kursa	3.2	Alpha	IND		3.6	Sigma	CMA
1.6	Alpha	GEM	Castor	2.8	Iota	ORI	Hatysa	3.2	Beta	CAP	Dabih	3.6	Lambda	GEM
1.6	Lambda	SCO	Shaula	2.8	Tau	PUP		3.2	Betal	CYG	Albireo	3.6	Chi	CAR
1.6	Gamma	CRU	Gacrux	2.8	Rho	PUP	Turais	3.2	Delta	DRA	Altais	3.6	Omicron	VEL
1.7	Gamma	ORI	Bellatrix	2.8	Mu	VEL		3.2	Phi	SGR		3.6	Psi	VEL
1.7	Epsilon	UMA	Alioth	2.8	Gamma	AQL	Tarazed	3.2	Eta	SGR		3.6	Phi	VEL
1.8	Beta	TAU	Elnath	2.8	Lambda	SGR	Kaus	3.2		SCO	G Sco	3.6	Eta	LEO
1.8	Epsilon	ORI	Anilnam	Boreal.				3.2	Delta	HER	Sarin	3.6	Zeta	LEO Adhafera
1.8	Gamma2	VEL	Regor	2.8	Delta	SGR	Kaus Media	3.2	Zeta	DRA	Aldibah	3.6	Gamma2	LEO
1.8	Epsilon	CAR	Avior	2.8	Upsilon	SCO	Lesath	3.2	Epsilon	OPH	Yed Poster.	3.6	Xi	HYA
1.8	Beta	CAR	Miaplacidus	2.8	Beta	ARA		3.2	Eta	LUP		3.6	Omicron	AND
1.9	Alpha	PER	Mirfak	2.8	Tau	SCO		3.2	Epsilon	LUP		3.6	Epsilon	GRU
1.9	Gamma	GEM	Alhena	2.8	Beta	HER	Kornephoros	3.2	Kappa	CEN		3.6	Zeta	PEG Homam
1.9	Epsilon	SGR	Kaus	2.8	Delta	OPH	Yed Prior	3.2	Mu	CEN		3.6	Zeta	CEP
Austral				2.8	Alpha	SER	Unuk-al-hai	3.2	Gamma	HYA		3.6	Beta	IND
1.9	Alpha	TRA	Atria	2.8	Beta	LUP	Kekouan	3.3	Pi3	ORI		3.6	Eta	CEP
1.9	Eta	UMA	Alkaid	2.8	Alpha2	LIB		3.3	Eta	AUR		3.6	Delta	PAV
2.0	Omicron	CET	Mira	Zubenelgenubi				3.3	Mu	LEP		3.6	Xi2	SGR
2.0	Zeta	ORI	Alnitak	2.8	Zeta	CEN		3.3	Alpha	PIC		3.6	Alpha	TEL
2.0	Beta	CMA	Mirzam	2.8	Eta	BOO	Muphrid	3.3	Sigma	PUP		3.6	Eta	PAV
2.0	Delta	CMA	Wezea	2.8	Iota	CEN		3.3	Zeta	HYA		3.6	Xi	SER
2.0	Delta	VEL	Koo She	2.8	Alpha	MUS		3.3	Alpha	LYN		3.6	Mu2	SCO
2.0	Alpha	UMA	Dubhe	2.8	Delta	CEN		3.3	Theta	UMA		3.6	Eta	HER
2.0	Alpha	GRU	Al Na'ir	2.9	Gamma	PEG	Algenib	3.3	Beta	CEP	Alfirk	3.6	Mu	SER
2.0	Alpha	PAV	Peacock	2.9	Beta	PER	Algol	3.3	Gamma	LYR	Sulafat	3.6	Phi1	LUP
2.0	Sigma	SGR	Nunki	2.9	Zeta	PER	Atik	3.3	Delta	LUP		3.6	Beta	BOO Nekkar
2.0	Theta	SCO	Sargas	2.9	Iota	AUR	Hassaleh	3.3	Alpha	CIR		3.6	Delta	OCT
2.1	Alpha	AND	Alpheratz	2.9	Beta	LEP	Nihal	3.3	Beta	MUS		3.6	Alpha	DRA Thuban
2.1	Beta	CET	Diphda	2.9	Upsilon	CAR		3.4	Beta	PHE		3.6	Delta	MUS
2.1	Alpha	UMI	Polaris	2.9	Theta	CAR		3.4	Gamma	PHE		3.6	Epsilon	CRU
2.1	Beta	AUR	Menkalinan	2.9	Alpha	TUC		3.4	Epsilon	CAS	Segin	3.7	Iota	CET Shemali
2.1	Alpha	HYA	Alphard	2.9	Beta	OPH	Cebalrai	3.4	Thetal	ERI	Acamar	3.7	Zeta	CAS
2.1	Alpha	OPH	Rasalhague	2.9	Eta	DRA	Aldibahin	3.4	Alpha	RET		3.7	Theta	CET
2.2	Alpha	ARI	Hamal	2.9	Beta	TRA		3.4	Alpha	DOR		3.7	Eta	PSC Alpherq
2.2	Kappa	ORI	Saiph	2.9	Alpha2	CVN	Cor Caroli	3.4	Eta	ORI	Algibbah	3.7	Chi	ERI
2.2	Lambda	VEL	Al Suhail	2.9	Gamma	VIR	Arich	3.4	Xi	GEM	Alzirr	3.7	Phi	ERI
2.2	Beta	LEO	Denebola	3.0	Alpha	HYI		3.4	Xi	PUP	Asmidiske	3.7		ARI
2.2	Beta	GRU	Al Dhanab	3.0	Eta	TAU	Alcyone	3.4		CAR		3.7	Rho	PER
2.2	Beta	UMI	Kochab	3.0	Epsilon	PER		3.4	Omega	CAR		3.7	Lambda	ORI Meissa
2.2	Theta	CEN	Menkent	3.0	Gamma	ERI	Zaurak	3.4		CAR	q Car	3.7	Gamma	LEP
2.3	Gamma1	AND	Almaak	3.0	Zeta	TAU	Alheka	3.4		CAR	p Car	3.7	Eta	GEM Propus
2.3	Zeta	PUP	Suhail	3.0	Zeta	CMA	Furud	3.4	Theta	LEO	Chertan	3.7	Kappa	GEM
Hadar				3.0	Omicron2	CMA		3.4	Gamma	CEP	Alrai	3.7		PUP
2.3	Iota	CAR	Aspidiske	3.0		VEL	N Vel	3.4	Delta	AQR	Skat	3.7	Beta	VOL
2.3	Gamma	CYG	Sadr	3.0	Delta	CAP	Deneb	3.4	Zeta	CYG		3.7	Alpha	PYX
2.3	Alpha	CRB	Alphecca	Algedi				3.4	Theta	AQL		3.7	Kappa	UMA
2.4	Beta	CAS	Caph	3.0	Beta	AQR	Sadalsuud	3.4	Delta	AQL		3.7	Lambda	HYA
2.4	Alpha	PHE	Ankaa	3.0	Delta	CYG		3.4	Tau	SGR		3.7	Nu	UMA Alula Bor.
2.4	Beta	AND	Mirach	3.0	Pi	SGR	Albaldah	3.4	Lambda	AQL	Althaimain	3.7	Delta	CRT
2.4	Eta	CMA	Aludra	3.0	Zeta	AQL	Dheneb	3.4	Eta	SER		3.7	Lambda	MUS
2.4	Beta	UMA	Merak	3.0	Gamma2	SGR	Alnasl	3.4	Nu	OPH		3.7	Mu	PEG Sadalbari
2.4	Gamma	DRA	Eltanin	3.0	Iotal	SCO		3.4	Theta	OPH		3.7	Iota	CEP
2.4	Kappa	SCO	Girtab	3.0	Alpha	ARA	Choo	3.4	Pi	HER		3.7	Theta	PEG Biham
2.4	Epsilon	SCO	Wei	3.0	Beta	DRA	Rastaban	3.4	Eta	SCO		3.7	Beta	DEL Rotanev
2.4	Delta	SCO	Dschubba	3.0	Zeta	HER	Ruticulus	3.4	Kappa	OPH		3.7	Alpha2	CAP Secunda
2.4	Eta	CEN		3.0	Sigma	SCO	Alniyat	3.4	Zeta	LUP		Gaedi		
2.4	Epsilon	CEN		3.0	Pi	SCO		3.4	Sigma	LIB		3.7	Gamma	SGE
2.4	Zeta	UMA	Mizar	3.0	Gamma	LUP		3.4	Pi	HYA		3.7	Chi	DRA
2.4	Gamma	CEN		3.0	Gamma	TRA		3.4	Zeta	VIR	Heze	3.7		OPH
2.5	Alpha	CAS	Schedar	3.0	Gamma	BOO	Seginus	3.4	Delta	UMA	Megrez	3.7	Gamma	OPH
2.5	Delta	ORI	Mintaka	3.0	Epsilon	VIR		3.5	Delta	AND		3.7	Delta	ARA
2.5	Gamma	UMA	Phecda	Vindemiatrix				3.5	Eta	CET		3.7	Beta	SER
2.5	Epsilon	PEG	Enif	3.0	Delta	CRV	Algoral	3.5	Epsilon	AUR		3.7	Upsilon	LIB
2.5	Epsilon	BOO	Izar	3.0	Delta	CRU		3.5	Delta	GEM	Wasat	3.7	Beta	CRB Nusakan
2.6	Alpha	LEP	Arneb	3.1	Beta	TRI		3.5	Omicron	UMA	Muscida	3.7	Pi	LUP

3.7	Delta	VIR	Minelauva	4.0	Delta	PHE	4.1	Mu	LEO	Rassalas	4.3		CET	
3.8		AND		4.0	Delta	CET	4.1	Gamma	CHA		4.3	Beta1	TUC	
3.8	Zeta	CET	Baten	4.0	Eta	PER	4.1	Pi	CEN		4.3	Zeta	AND	
Kaitos				4.0	Eta	ERI	Azha	4.1	Sigma	LEO	4.3	Phi	AND	
3.8	Omicron	TAU		4.0	Kappa	PER	Misam	4.1	Gamma	CRT	4.3	Alpha	PSC Al-Rischa	
3.8	Xi	TAU		4.0	Alpha	FOR		4.1	Lambda	DRA	Giansar	4.3	Xi2	CET
3.8	Epsilon	ERI		4.0	Tau4	ERI	Angetenar	4.1		AQR		4.3		PER
3.8	Beta	RET		4.0		TAU	Maia	4.1	Tau2	AQR		4.3		TAU
3.8		TAU	Electra	4.0	Xi	PER	Menkib	4.1	Lambda	PEG		4.3	Tau5	ERI
3.8		TAU	Atlas	4.0	Lambda	TAU		4.1	Eta	AQR		4.3	Psi	PER
3.8	Alpha	HOR		4.0	Upsilon	PER	Nembus	4.1	Alpha	EQU	Kitalpha	4.3		TAU Merope
3.8	Upsilon2	ERI	Theemini	4.0	Omicron1	ERI	Beid	4.1		CYG		4.3	Lambda	PER
3.8	Pi4	ORI		4.0		ERI		4.1	Alpha	CRA		4.3	Mu	PER
3.8	Sigma	ORI		4.0	Thetal	TAU		4.1	Thetal	SER		4.3	Mu	TAU
3.8	Delta	LEP		4.0	Nu	ERI		4.1		OPH		4.3	Upsilon1	ERI
3.8	Eta	LEP		4.0		ERI	Sceptrum	4.1	Epsilon1	ARA		4.3		TAU
3.8	Gamma2	VOL		4.0	Eta	COL		4.1	Omegal	SCO		4.3	Tau	TAU
3.8	Omega	CMA		4.0	Delta	COL	JabhalAkkrab					4.3	Omicron2	ORI
3.8	Beta	CNC		4.0	Delta	VOL		4.1	Theta	DRA		4.3	Lambda	ERI
3.8	Theta	HYA		4.0	Alpha	MON		4.1	Epsilon	TRA		4.3	Lambda	LEP
3.8		LYN		4.0	Beta	PYX		4.1	Delta	SER		4.3		ORI
3.8		UMA		4.0		HYA		4.1		CEN		4.3		GEM
3.8	Omicron	LEO	Subra	4.0		CAR		4.1	Theta	BOO		4.3	Sigma	GEM
3.8		CAR	1 Car (v)	4.0		CAR		4.1	Psi	CEN		4.3		PUP
3.8	Beta	VIR	Zavijava	4.0	Mu	HYA		4.1	Iota	LUP		4.3		PUP
3.8		AQR		4.0	Iota	LEO		4.2	Zeta	TUC		4.3		PUP
3.8	Lambda	AQR		4.0	Beta	HYA		4.2	Beta2	TUC		4.3	Theta	CHA
3.8	Nu	OCT		4.0	Omega	PSC		4.2	Kappa	CAS		4.3	Eta	HYA
3.8	Gamma	CAP	Nashira	4.0	Lambda	AND		4.2	Upsilon	AND		4.3	Alpha	CNC Acubens
3.8	Zeta	CAP		4.0	Gamma	TUC		4.2	Phi	PER		4.3		VEL
3.8	Tau	CYG		4.0	Iota	GRU		4.2	Delta	HYI		4.3	Upsilon1	HYA
3.8	Epsilon	AQR	Albali	4.0	Theta	GRU		4.2	Epsilon	HYI		4.3	Kappa	AND
3.8	Delta	SGE		4.0	Deltal	GRU		4.2	Theta	PER		4.3	Iota	PSC
3.8	Zeta	TEL		4.0	Delta	CEP		4.2	Tau3	ERI		4.3	Iota	AND
3.8	Omicron	HER		4.0	Gamma	AQR	Sadachbia	4.2	Iota	PER		4.3	Phi	AQR
3.8	Theta	ARA		4.0	Iota	PEG		4.2	Tau6	ERI		4.3	Delta	PSA
3.8	Xi	HER		4.0	Mu	CEP	Granate	4.2	Epsilon	RET		4.3	Gamma	PSA
3.8	Iota	HER		Star				4.2	Delta3	TAU		4.3	Xi	PEG
3.8	Zeta2	SCO		4.0	Nu	CYG		4.2	Beta	CAM		4.3	Delta2	GRU
3.8	Eta	ARA		4.0	Epsilon	DEL		4.2	Gammal	CAE		4.3	Pi2	CYG
3.8	Gamma	HER		4.0		CYG		4.2	Iota	LEP		4.3	Kappa	PEG
3.8	Xi	SCO		4.0	Epsilon	PAV		4.2	Kappa	LEP		4.3		CAP
3.8	Rho	SCO		4.0	Eta	CYG		4.2		ORI		4.3	Iota	CAP
3.8	Epsilon	SER		4.0	Eta	AQL		4.2	Nu	AUR		4.3		PEG
3.8	Tau	LIB		4.0	Epsilon	DRA	Tyl	4.2	Mu	ORI		4.3	Sigma	CYG
3.8	Kappa1	LUP		4.0	Alpha	SGR	Rukbat	4.2	Theta	CMA		4.3		CYG
3.8	Alpha	APS		4.0	Rho1	SGR		4.2	Rho	GEM		4.3	Theta	CEP
3.8		VIR		4.0	Kappa	CYG		4.2	Upsilon	GEM		4.3		CYG
3.8	Rho	BOO		4.0	Beta	CRA		4.2		PUP		4.3	Iota	AQL
3.8	Phi	CEN		4.0	Gamma	CRA		4.2		PUP		4.3	Beta2	SGR
3.9	Epsilon	PHE		4.0		AQL		4.2		PUP		4.3		LYR
3.9	Kappa	PHE		4.0	Kappa	PAV		4.2	Zeta	MON		4.3		HER
3.9	Mu	AND		4.0	Zeta	PAV		4.2	Delta	HYA		4.3	Zeta1	LYR
3.9	Omicron	PER	Ati	4.0	Alpha	SCT		4.2	Delta	CNC	Asellus	4.3	Kappa	LYR
3.9	Nu	PER		4.0	Mu	SGR	Polis	Aus.				4.3		HER
3.9	Nu	TAU		4.0		OPH		4.2	Iota1	CNC		4.3	Iota	OPH
3.9	Gamma	TAU	Hyadum I	4.0	Theta	HER		4.2		CAR		4.3		SCO
3.9	Delta1	TAU		4.0	Gamma2	NOR		4.2	Alpha	CRT	Alkes	4.3	Sigma	HER
3.9	Pi5	ORI		4.0	Nu	SCO	Jabbah	4.2	Nu	VIR		4.3	Phi	HER
3.9	Zeta	AUR	Sadatoni	4.0	Chi	LUP		4.2	Zeta	GRU		4.3	Iota1	NOR
3.9	Epsilon	COL		4.0	Omega	LUP		4.2	Beta	OCT		4.3	Theta	LIB
3.9	Beta	PIC		4.0	Gamma	LIB		4.2	Epsilon	PSA		4.3	Kappa	SER
3.9	Delta	AUR	Zubenelhakrabi	4.0				4.2	Theta	AQR	Ancha	4.3	Zeta	UMI Alifa
3.9	Kappa	CMA		4.0		LUP		4.2		LAC		4.3	Gamma	CIR
3.9	Zeta	GEM	Mekbuda	4.0	Mu	VIR		4.2	Epsilon	CEP		4.3	Mu	LUP
3.9	Iota	GEM		4.0	Rho	LUP		4.2	Rho	CYG		4.3		CEN
3.9	Zeta	VOL		4.0	Upsilon1	CEN		4.2	Gamma	PAV		4.3	Lambda	BOO
3.9	Alpha	CHA		4.0		CEN		4.2	Theta	IND		4.3	Tau	VIR
3.9		CAR		4.0		UMA	Alcor	4.2	Theta	CAP		4.3	Upsilon	BOO
3.9	Upsilon	UMA		4.0	Zeta	UMA		4.2	Omega	CAP		4.3		CEN
3.9	Rho	LEO		4.0		CEN		4.2	Psi	CAP		4.3	Beta	COM
3.9		VEL		4.0	Tau	CEN		4.2		CYG		4.3	Mu1	CRU
3.9		LMI	Praecipua	4.0	Gamma	MUS		4.2	Iota	SGR		4.3	Beta	CVN Chara
3.9		CAR		4.0	Sigma	CEN		4.2	Chi	CYG		4.4	Theta	AND
3.9	Xi	UMA	Alula	4.0	Eta	VIR	Zaniah	4.2	Beta1	SGR	Arkab	4.4	Eta	PHE
Austr.				4.0	Rho	CEN		4.2	Epsilon	AQL		4.4	Nu	AND
3.9	Chi	UMA	Alkafzah	4.0	Eta	CRU		4.2	Phi	DRA		4.4	Alpha	SCL
3.9	Gamma	PSC		4.1	Zeta	PHE		4.2		SCO		4.4	Psi	PHE
3.9	Alpha	LAC		4.1	Upsilon	CET		4.2		OPH		4.4	Kappa	ERI
3.9	Xi	CYG		4.1		CAS		4.2	Xi	OPH		4.4	Pi	CET
3.9	Alpha	DEL	Sualocin	4.1	Gamma	TRI		4.2	Nu	SER		4.4	Mu	CET
3.9	Beta	AQL	Alshain	4.1	Iota	ERI		4.2	Beta	APS		4.4	Theta2	ERI
3.9	Iota2	CYG		4.1	Tau	PER	Kerb	4.2	Phi	OPH		4.4		TAU
3.9	Omicron	SGR		4.1		ERI		4.2	Theta	LUP		4.4		TAU Taygete
3.9	Lambda	PAV		4.1	Mu	ERI		4.2	Epsilon	CRB		4.4	Tau8	ERI
3.9		HER		4.1	Gamma	MON		4.2	Theta	CRB		4.4	Gamma	RET
3.9	Xi	DRA	Juza	4.1	Nu	GEM		4.2	Beta	CIR		4.4	Gamma	DOR
(Grum.)				4.1	Nu2	CMA		4.2	Lambda	LUP		4.4	Kappa1	TAU
3.9	Epsilon	HER		4.1	Omicron1	CMA		4.2	Tau2	LUP		4.4	Upsilon	TAU
3.9	Gamma	APS		4.1	Gamma	CMA	Mulifen	4.2	Iota	VIR	Syrma	4.4		TAU
3.9	Lambda	OPH	Marfik	4.1	Delta	MON		4.2	Kappa	VIR		4.4	Alpha	CAE
3.9	Tau	HER		4.1		PUP		4.2	Upsilon2	CEN		4.4	Pi2	ORI
3.9	Delta	TRA		4.1		VEL		4.2	Eta	CRV		4.4	Alpha	CAM
3.9	Gamma	SER		4.1		VEL		4.2	Zeta	CRU		4.4		CAM
3.9	Gamma	CRB		4.1	Gamma	PYX		4.2	Epsilon	MUS		4.4		ORI
3.9	Zeta	BOO		4.1	Alpha	VOL		4.2	Alpha	CRV	Alchiba	4.4	Phi2	ORI
3.9	Kappa	DRA		4.1	Iota	HYA		4.2	Omicron	VIR		4.4	Delta	DOR

4.4	Gamma	PIC	4.5		CMI	4.6		UMA	4.7	Theta	LEP
4.4	Gamma	COL	4.5	Sigma	HYA	4.6	Upsilon2	HYA	4.7	Beta	MON
4.4	Nu	ORI	4.5		CAR	4.6		LEO	4.7		MON
4.4	Xi	ORI	4.5		CAR	4.6		VEL	4.7		MON
4.4	Kappa	COL	4.5		UMA	4.6	Iota	ANT	4.7		GEM
4.4		LYN	4.5		HYA	4.6	Phi	LEO	4.7		CMA
4.4	Epsilon	MON	4.5	Lambda	LEO	4.6	Mu	MUS	4.7	Gamma	CNC Asellus
4.4	Lambda	CMA	4.5	Tau2	HYA	4.6	Epsilon	TUC	Bor.		
4.4	Xi1	CMA	4.5	Phi	UMA	4.6	Delta	SCL	4.7	Tau	UMA
4.4		CAR	4.5		LMI	4.6	Omega2	AQR	4.7	Chi	LEO
4.4		CAR	4.5	Alpha	SEX	4.6	Lambda	PSC	4.7		AQR
4.4	Iota	CMA	4.5	Delta2	CHA	4.6	Upsilon	PEG	4.7		PEG
4.4	Tau	CMA	4.5		LEO	4.6	Tau	PEG	4.7		PEG
4.4		PUP	4.5	Beta	CRT	4.6	Psi2	AQR	4.7		LAC
4.4	Epsilon	VOL	4.5	Upsilon	LEO	4.6	Chi	AQR	4.7	Epsilon	IND
4.4		PUP	4.5		LEO	4.6		AND	4.7	Mu1	CYG
4.4		PUP	4.5	Theta	PSC	4.6	Pi	CEP	4.7	Gamma	MIC
4.4		LYN	4.5		AQR	4.6	Beta	PSC	4.7		CYG
4.4		CAR	4.5		AQR	4.6		LAC	4.7	Zeta	DEL
4.4	Rho	HYA	4.5		LAC	4.6		LAC	4.7		VUL
4.4	Kappa	PYX	4.5	Delta	TUC	4.6	Zeta2	AQR	4.7	Rho	DRA
4.4	Alpha	ANT	4.5	Delta	IND	4.6	Pi	AQR	4.7		VUL
4.4	Beta	LMI	4.5	Nu	CEP	4.6		LAC	4.7	Epsilon1	LYR
4.4		LEO	4.5		PEG	4.6	Beta	LAC	4.7	Delta	SCT
4.4		CEN	4.5	Kappa	CAP	4.6	Mu	PSA	4.7	Gamma	SCT
4.4	Beta	SCL	4.5	Nu	AQR	4.6	Lambda	GRU	4.7		OPH
4.4	Gamma	SCL	4.5		AQR	4.6	Omicron	AQR	4.7		HER
4.4	Psi1	AQR	4.5	Lambda	CYG	4.6	Epsilon	CAP	4.7		SCO
4.4		AQR	4.5	Gamma2	DEL	4.6	Delta	EQU	4.7	Xi	CRB
4.4	Beta	PSA	4.5	Delta	DEL	4.6		CAP	4.7		SCO
4.4	Zeta1	AQR	4.5		AQL	4.6	Eta	IND	4.7	Delta	CRB
4.4	Pi2	PEG	4.5		VUL	4.6	Phil	PAV	4.7	Psi2	LUP
4.4	Iota	AQR	4.5	Beta	SGE	4.6	Rho	CAP	4.7		LUP
4.4	Xi	CEP Kurhah	4.5	Theta	LYR	4.6		CYG	4.7		LIB
4.4	Iota	PSA	4.5	Eta	LYR	4.6		SGR	4.7	Psi	BOO
4.4	Upsilon	CYG	4.5	Delta2	LYR	4.6		SGR	4.7	Omicron	BOO
4.4	Alpha1	CAP Prima Gaedi	4.5	Zeta	SCT	4.6		SGR	4.7		HYA R Hya (v)
4.4	Kappa	CEP	4.5	Gammal	SGR	4.6	Theta	CYG	4.7		VIR
4.4	Theta1	SGR	4.5	Zeta	SER	4.6	Mu	AQL	4.7		CVN
4.4	Omega	SGR	4.5	Nu	HER	4.6	Alpha	VUL	4.7		CEN
4.4	Alpha	SGE	4.5	Lambda	HER	4.6	Upsilon	SGR	4.8	Theta	OCT
4.4	Beta	SCT	4.5	Omega	OPH	4.6	Pi	DRA	4.8		CET
4.4		HER	4.5	Chi	OPH	4.6		VUL	4.8		CET
4.4	Xi	PAV	4.5	Omega	HER	4.6	Tau	DRA	4.8	Lambda1	PHE
4.4	Pi	PAV	4.5	Eta	NOR	4.6	Psi	SGR	4.8	Upsilon2	CAS
4.4		OPH	4.5	Iota	SER	4.6	Delta	CRA	4.8	Kappa	TUC
4.4		HER	4.5	Mu1	BOO	4.6	Nu2	SGR	4.8		CET
4.4		SGR	4.5		LIB	4.6		HER	4.8	Chi	CET
4.4	Omicron	SER	4.5		HYA	4.6	Theta	CRA	4.8	Gamma2	ARI Mesartim
4.4	Mu	OPH	4.5	Sigma	BOO	4.6	Nu	PAV	4.8	Gammal	ARI
4.4	Delta	UMI Yildun	4.5	Chi	CEN	4.6		SGR	4.8	Xi	PSC
4.4		OPH	4.5	Tau	BOO	4.6	Epsilon	TEL	4.8		CET
4.4		OPH	4.5	Alpha	COM	4.6	Tau	OPH	4.8	Lambda	ARI
4.4		HER	4.6		PSC	4.6	Sigma	ARA	4.8		AND
4.4		OPH	4.6		CET	4.6		HER	4.8	Sigma	CET
4.4	Epsilon	UMI	4.6		PSC	4.6	Zeta1	SCO	4.8	Zeta	HYI
4.4	Upsilon	OPH	4.6	Mu	PHE	4.6		OPH	4.8	Tau2	ERI
4.4		OPH	4.6	Phi1	CET	4.6	Omega2	SCO	4.8	Omega	PER
4.4	Omicron	SCO	4.6	Eta	AND	4.6	Upsilon	HER	4.8	Zeta	ERI Zibal
4.4		SCO	4.6	Phi	PSC	4.6	Chi	HER	4.8	Kappa	RET
4.4	Lambda	SER	4.6		CAS	4.6		SCO	4.8		ERI
4.4	Omicron	LUP	4.6	Iota	CAS	4.6	Psi1	LUP	4.8	Iota	RET
4.4	Sigma	LUP	4.6	Epsilon	CET	4.6	Phi2	LUP	4.8	Delta	HOR
4.4		UMI	4.6		ARI	4.6	Iota1	LIB	4.8	Omega2	TAU
4.4		CEN	4.6	Tau1	ERI	4.6		VIR	4.8	Delta2	TAU
4.4		CEN	4.6		ARI	4.6	Xi	BOO	4.8	Rho	TAU
4.4		VIR	4.6	Pi	PER	4.6		HYA	4.8		ERI
4.4	Theta	VIR	4.6	Epsilon	ARI	4.6	Tau1	LUP	4.8	Zeta	DOR
4.4	Xi2	CEN	4.6		ERI	4.6		HYA	4.8	Mu	AUR
4.4	Beta	CHA	4.6		ERI	4.6	Lambda	VIR	4.8	Theta	DOR
4.4	Theta1	CRU	4.6	Pi	ERI	4.6	Kappa	BOO	4.8	Omicron	COL
4.5	Sigma	AND	4.6	Tau9	ERI	4.6		CEN	4.8		AUR
4.5	Pi	AND	4.6		ERI	4.6		CVN	4.8		TAU
4.5	Epsilon	AND	4.6		TAU	4.6	Iota	CRU	4.8		ORI
4.5	Delta	PSC	4.6		ERI	4.6	Gamma	COM	4.8		MON
4.5	Epsilon	PSC	4.6		ORI	4.6	Kappa	CHA	4.8	Delta	PIC
4.5	Theta	CAS	4.6	Rho	ORI	4.6	Pi	VIR	4.8	Eta2	DOR
4.5	Omicron	PSC	4.6		ORI	4.7	Omicron	CAS	4.8		CMA
4.5	Xi1	CET	4.6	Upsilon	ORI	4.7	Tau	PSC	4.8		LYN
4.5	Beta	FOR	4.6	Tau	AUR	4.7	Upsilon	PSC	4.8	Pi2	UMA Ta Tsun
4.5	Delta	ARI Botein	4.6	Lambda	COL	4.7	Nu	PSC	4.8		HYA
4.5	Sigma	PER	4.6	Chi1	ORI	4.7	Eta2	HYI	4.8	Theta	PYX
4.5		ERI	4.6	Pi	AUR	4.7	Nu	FOR	4.8	Lambda	PYX
4.5	Delta	RET	4.6	Beta	MON	4.7	Omega	FOR	4.8	Tau1	HYA
4.5		TAU	4.6	Nu3	CMA	4.7	Nu	HYI	4.8		LMI
4.5	Omicron2	ERI Klid	4.6		GEM	4.7		PER	4.8		CAR
4.5		PER	4.6	Pi	CMA	4.7	Lambda	CET	4.8		UMA
4.5	Omega	ERI	4.6	Gamma	CMI	4.7		PER	4.8		LMI
4.5	Phi1	ORI	4.6		PUP	4.7		CAM	4.8	Omega	UMA
4.5	Omega	ORI	4.6	Omicron	PUP	4.7	Gamma	CAM	4.8		UMA
4.5		TAU	4.6		PUP	4.7	Pi1	ORI	4.8	Theta	CRT
4.5	Kappa	AUR	4.6	Delta	PYX	4.7	Pi6	ORI	4.8	Omicron	HYA
4.5		MON	4.6		HYA	4.7	Iota	TAU	4.8	Zeta	CRT
4.5	Xi2	CMA	4.6	Kappa	LEO	4.7	Psi1	ORI	4.8	Psi	PEG
4.5		LYN	4.6	Epsilon	ANT	4.7	Psi2	ORI	4.8	Rho	CAS
4.5	Tau	GEM	4.6		LMI	4.7		TAU	4.8		AQR
4.5		LYN	4.6		UMA	4.7	Chi2	ORI	4.8	Iota	PHE

4.8		AQR	4.9		ORI	5.0	Lambda	HYI	5.0	Tau	PSA
4.8	Rho	GRU	4.9		LYN	5.0	Nu	CAS	5.0		CEP
4.8		LAC	4.9	Mu	CMA	5.0	Upsilon1	CAS	5.0		PEG
4.8	Sigma	AQR	4.9		CMI	5.0		PSC	5.0		PEG
4.8	Mul	GRU	4.9	Omicron	GEM	5.0		CET	5.0	Theta	PSA
4.8	Upsilon	PSA	4.9		MON	5.0	Xi	AND Adhil	5.0		CAP
4.8	Pil	CYG Azelfalage	4.9		LYN	5.0	Psi	CAS	5.0		CYG
4.8	Xi	AQR	4.9	Zeta1	CNC Tegmine	5.0	Omega	AND	5.0	Omicron	PAV
4.8		PEG	4.9	Sigma2	UMA	5.0	Phi	PHE	5.0	Iota	IND
4.8	Theta1	MIC	4.9		UMA	5.0	Omega	CAS	5.0		VUL
4.8	Epsilon	MIC	4.9	Theta	ANT	5.0	Chi	PHE	5.0	Rho	PAV
4.8	Gamma	EQU	4.9	Pi	LEO	5.0		PER	5.0		AQL
4.8	Eta	CAP	4.9		LEO	5.0	Nu	CET	5.0		AQL
4.8	Mu	AQR	4.9	Sigma	CAS	5.0		PER	5.0		CYG
4.8		VUL	4.9	Kappa	PSC	5.0	Beta	HOR	5.0	Rho	AQL
4.8	Alpha	MIC	4.9	Omicron	CEP	5.0		PER	5.0		CYG
4.8		VUL	4.9		CAS	5.0	Zeta	ARI	5.0		SGR
4.8	Nu	CAP Alshat	4.9		AND	5.0	Kappa1	CET	5.0		CYG
4.8		CYG	4.9	Eta	GRU	5.0		PER	5.0	Zeta	SGE
4.8		SGR	4.9	Omicron	PEG	5.0	Delta	FOR	5.0		CYG
4.8	Psi	CYG	4.9		LAC	5.0		PER	5.0		SGR
4.8	Phi	CYG	4.9	Nu	TUC	5.0		TAU	5.0		CYG
4.8	Sigma	DRA	4.9		PEG	5.0		TAU	5.0	Kappa	AQL
4.8	Epsilon	CRA	4.9		PEG	5.0		ERI	5.0	Iota	TEL
4.8	Omicron	DRA	4.9		PEG	5.0	Beta	CAE	5.0		AQL
4.8		SGR	4.9	Nu	PEG	5.0		AUR	5.0	Chi1	SGR
4.8		OPH	4.9		CEP	5.0	Omega	AUR	5.0		AQL
4.8		SGR	4.9		CEP Alphirk	5.0	Eta2	PIC	5.0		SGR
4.8	Lambda	ARA	4.9		CYG	5.0		AUR	5.0		LYR
4.8		OPH	4.9		CYG	5.0		TAU	5.0	Zeta	CRA
4.8	Zeta	APS	4.9	Zeta	IND	5.0		ERI	5.0	Lambda	TEL
4.8		HER	4.9		CYG	5.0		ORI	5.0	Nu1	SGR
4.8		OPH	4.9		CYG	5.0		ORI	5.0		SGR
4.8		DRA	4.9	Omega1	CYG	5.0	Nu2	COL	5.0		AQL
4.8	Epsilon	NOR	4.9		CYG	5.0		TAU	5.0	Epsilon	SCT
4.8	Rho	OPH	4.9	Xi	TEL	5.0		TAU	5.0		DRA
4.8	Sigma	SER	4.9		CYG	5.0	Upsilon	AUR	5.0	Delta1	TEL
4.8	Delta1	APS	4.9	Xi	AQL	5.0		ORI	5.0		DRA
4.8	Delta	NOR	4.9		VUL	5.0		MON	5.0	Mu	LYR
4.8	Pi	SER	4.9		VUL	5.0	Theta	COL	5.0		HER
4.8		LIB	4.9		CYG	5.0		MON	5.0		HER
4.8	Kappa	CRB	4.9	Nu	AQL	5.0		AUR	5.0		DRA
4.8	Kappa	LIB	4.9		CYG	5.0		AUR	5.0		HER
4.8	Epsilon	CIR	4.9		VUL	5.0		MON	5.0		DRA
4.8		BOO	4.9	Eta	SCT	5.0	Psi7	AUR	5.0	Nu2	DRA Kuma
4.8		DRA	4.9	Upsilon	DRA	5.0		CAM	5.0	Nu1	DRA Kuma
4.8		UMA	4.9		DRA	5.0		MON	5.0		DRA
4.8		VIR	4.9		OPH	5.0		MON	5.0	Mu	NOR
4.8	Lambda	CRU	4.9		OPH	5.0		CMA	5.0		HER
4.8	Psi	VIR	4.9	Psi1	DRA	5.0		GEM	5.0		DRA
4.8	Chi	VIR	4.9	Omega	DRA	5.0		LYN	5.0	Eta	UMI Alasco
4.8		COM	4.9		HER	5.0		PUP	5.0	Kappa	NOR
4.8		COM	4.9		OPH	5.0		GEM	5.0	Lambda	LIB
4.9	Chi	PEG	4.9		HER	5.0	Phi	GEM	5.0		LIB
4.9	Eta	SCL	4.9		HER	5.0		PUP	5.0	Nu2	BOO
4.9	Lambda	CAS	4.9	Zeta	TRA	5.0		MON	5.0	Epsilon	LIB
4.9	Xi	CAS	4.9	Gamma1	NOR	5.0	Chi	GEM	5.0	Eta	CRB
4.9		CET	4.9	Psi	SCO	5.0		PUP	5.0	Nu1	LUP
4.9	Chi	PSC	4.9	Tau	CRB	5.0	Zeta	PYX	5.0		LUP
4.9	Zeta1	PSC	4.9	Beta2	SCO	5.0		HYA	5.0		BOO
4.9	Nu	PHE	4.9	Iota	CRB	5.0	Rho	UMA	5.0		LIB
4.9	Chi	CAS	4.9	Rho	SER	5.0	Kappa	HYA	5.0		LIB
4.9	Tau	AND	4.9		LIB	5.0	Gamma	SEX	5.0		BOO
4.9		AND	4.9		BOO	5.0		LEO	5.0	Phi	VIR
4.9	Rho	CET	4.9	Omega	BOO	5.0	Beta	SEX	5.0		HYA
4.9		PER	4.9		BOO	5.0	Phi3	HYA	5.0		BOO
4.9		PER	4.9	Pi1	BOO	5.0		LMI	5.0		HYA
4.9	Pi	TAU	4.9	Eta	APS	5.0		LEO	5.0		LEO
4.9	Sigma2	TAU	4.9	Iota	BOO	5.0		LEO	5.0		UMI
4.9	Psi	ERI	4.9		CVN	5.0	Chi1	HYA	5.0		VIR
4.9		ORI	4.9		VIR	5.0	Lambda	CRT	5.0	Iota1	MUS
4.9	Lambda	AUR	4.9	Eta	MUS	5.0	Omicron1	CEN	5.0	Sigma	VIR
4.9	Chi	AUR	4.9		COM	5.0	Epsilon	CHA	5.0		VIR
4.9		TAU	4.9	Xi1	CEN	5.0		PSC	5.0	Psi	HYA
4.9		TAU	4.9		UMA	5.0		PEG	5.0		COM
4.9	Xi	AUR	4.9		COM	5.0		AND	5.0	Rho	VIR
4.9	Xi	COL	4.9		COM	5.0		PEG	5.0		COM
4.9		TAU	5.0	Zeta	SCL	5.0	Rho	PEG	5.0		CVN
4.9		LEP	5.0	Pi	CAS	5.0		AQR	5.0	Theta2	CRU

# CATALOGO 100 STELLE PIU' LUMINOSE

## 100 BRIGHTEST STARS

Nome	HH MM SS	° ° ' ' "	magn.	moto proprio
Bayer	J2000	J2000	vis.	AR DEC
Alp CMa	06 45 08.9	-16 42 58	-1.46	-0.553 -1.205
Alp Car	06 23 57.1	-52 41 45	-0.72	+0.022 +0.021
Alp Boo	14 15 39.7	+19 10 57	-0.04	-1.093 -1.998
Alp1Cen	14 39 35.9	-60 50 07	-0.01	-3.642 +0.699
Alp Lyr	18 36 56.3	+38 47 01	0.03	+0.202 +0.286
Alp Aur	05 16 41.4	+45 59 53	0.08	+0.076 -0.425
Bet Ori	05 14 32.3	-08 12 06	0.12	0.000 -0.001
Alp CMi	07 39 18.1	+05 13 30	0.38	-0.710 -1.023
Alp Eri	01 37 42.9	-57 14 12	0.46	+0.095 -0.035
Alp Ori	05 55 10.3	+07 24 25	0.50	+0.026 +0.009
Bet Cen	14 03 49.4	-60 22 23	0.61	-0.032 -0.019
Alp Aql	19 50 47.0	+08 52 06	0.77	+0.538 +0.386
Alp Tau	04 35 55.2	+16 30 33	0.85	+0.063 -0.190
Alp Sco	16 29 24.4	-26 25 55	0.96	-0.010 -0.020
Alp Vir	13 25 11.6	-11 09 41	0.98	-0.041 -0.028
Bet Gem	07 45 18.9	+28 01 34	1.14	-0.628 -0.046
Alp PsA	22 57 39.1	-29 37 20	1.16	+0.333 -0.165
Bet Cru	12 47 43.2	-59 41 19	1.25	-0.048 -0.014
Alp Cyg	20 41 25.9	+45 16 49	1.25	+0.003 +0.002
Alp1Cru	12 26 35.9	-63 05 57	1.33	-0.036 -0.012
Alp2Cen	14 39 36.1	-60 50 08	1.33	-3.646 +0.700
Alp Leo	10 08 22.3	+11 58 02	1.35	-0.248 +0.006
Eps CMa	06 58 37.5	-28 58 20	1.50	+0.004 +0.003
Lam Sco	17 33 36.5	-37 06 14	1.63	-0.001 -0.029
Gam Cru	12 31 09.9	-57 06 48	1.63	+0.023 -0.262
Gam Ori	05 25 07.9	+06 20 59	1.64	-0.009 -0.014
Bet Tau	05 26 17.5	+28 36 27	1.65	+0.022 -0.175
Bet Car	09 13 12.0	-69 43 02	1.68	-0.162 +0.108
Eps Ori	05 36 12.8	-01 12 07	1.70	+0.001 -0.002
Alp2Cru	12 26 36.5	-63 05 58	1.73	-0.034 -0.007
Alp Gru	22 08 14.0	-46 57 40	1.74	+0.129 -0.151
Eps UMa	12 54 01.7	+55 57 35	1.77	+0.112 -0.006
Gam2Vel	08 09 32.0	-47 20 12	1.78	-0.004 +0.006
Alp UMa	11 03 43.7	+61 45 03	1.79	-0.119 -0.067
Alp Per	03 24 19.4	+49 51 40	1.79	+0.024 -0.025
Del CMa	07 08 23.5	-26 23 36	1.84	-0.003 +0.004
Eps Sgr	18 24 10.3	-34 23 05	1.85	-0.038 -0.124
Eta UMa	13 47 32.4	+49 18 48	1.86	-0.122 -0.011
Eps Car	08 22 30.8	-59 30 35	1.86	-0.026 +0.014
The Sco	17 37 19.2	-42 59 52	1.87	+0.015 -0.002
Bet Aur	05 59 31.7	+44 56 51	1.90	-0.057 0.000
Alp TrA	16 48 39.9	-69 01 40	1.92	+0.014 -0.034
Gam Gem	06 37 42.7	+16 23 57	1.93	+0.042 -0.042
Alp Pav	20 25 38.9	-56 44 06	1.94	+0.007 -0.089
Del Vel	08 44 42.2	-54 42 30	1.96	+0.023 -0.078
Bet CMa	06 22 42.0	-17 57 21	1.98	-0.006 0.000
Alp Hya	09 27 35.2	-08 39 31	1.98	-0.014 +0.033
Alp Gem	07 34 36.0	+31 53 18	1.98	-0.171 -0.098
	15 59 30.2	+25 55 13	2.0	-0.005 +0.013
Alp Ari	02 07 10.4	+23 27 45	2.00	+0.190 -0.148
Sig Sgr	18 55 15.9	-26 17 48	2.02	+0.013 -0.054
Alp UMi	02 31 48.7	+89 15 51	2.02	+0.038 -0.015
Bet Cet	00 43 35.4	-17 59 12	2.04	+0.234 +0.033
Zet Ori	05 40 45.5	-01 56 34	2.05	+0.003 -0.002
Kap Ori	05 47 45.4	-09 40 11	2.06	+0.002 -0.002
The Cen	14 06 41.0	-36 22 12	2.06	-0.519 -0.519
Bet And	01 09 43.9	+35 37 14	2.06	+0.178 -0.114
Alp And	00 08 23.3	+29 05 26	2.06	+0.136 -0.163
Bet UMi	14 50 42.3	+74 09 20	2.08	-0.031 +0.012
Alp Oph	17 34 56.1	+12 33 36	2.08	+0.120 -0.226
Bet Gru	22 42 40.1	-46 53 05	2.10	+0.137 -0.008
Bet Per	03 08 10.1	+40 57 20	2.12	+0.004 -0.001
Bet Leo	11 49 03.6	+14 34 19	2.14	-0.497 -0.114
Gam Cen	12 41 31.0	-48 57 35	2.17	-0.189 -0.005
Gam Cyg	20 22 13.7	+40 15 24	2.20	+0.004 0.000
Lam Vel	09 07 59.8	-43 25 57	2.21	-0.019 +0.013
Del Ori	05 32 00.4	-00 17 57	2.23	+0.001 -0.002
Alp CrB	15 34 41.3	+26 42 53	2.23	+0.121 -0.089
Gam Dra	17 56 36.4	+51 29 20	2.23	-0.008 -0.019
Alp Cas	00 40 30.5	+56 32 14	2.23	+0.053 -0.032
Zet Pup	08 03 35.1	-40 00 12	2.25	-0.027 +0.012
Iot Car	09 17 05.4	-59 16 31	2.25	-0.020 +0.008
Gam1And	02 03 54.0	+42 19 47	2.26	+0.045 -0.052
Zet UMa	13 23 55.5	+54 55 31	2.27	+0.122 -0.020
Bet Cas	00 09 10.7	+59 08 59	2.27	+0.525 -0.181
Eps Sco	16 50 09.8	-34 17 36	2.29	-0.611 -0.255



Nome	HH MM SS	° ° ' ' " "	magn.	moto proprio	
Bayer	J2000	J2000	vis.	AR	DEC
Alp Lup	14 41 55.8	-47 23 18	2.30	-0.021	-0.018
Eps Cen	13 39 53.2	-53 27 59	2.30	-0.028	-0.016
Eta Cen	14 35 30.4	-42 09 28	2.31	-0.035	-0.035
Del Sco	16 00 20.0	-22 37 18	2.32	-0.012	-0.022
Bet UMa	11 01 50.5	+56 22 57	2.37	+0.082	+0.034
Alp Phe	00 26 17.0	-42 18 22	2.39	+0.203	-0.396
Eps Peg	21 44 11.2	+09 52 30	2.39	+0.031	-0.001
Kap Sco	17 42 29.3	-39 01 48	2.41	-0.006	-0.027
Bet Peg	23 03 46.5	+28 04 58	2.42	+0.189	+0.137
Eta Oph	17 10 22.7	-15 43 29	2.43	+0.039	+0.098
Alp Cep	21 18 34.8	+62 35 08	2.44	+0.151	+0.049
Gam UMa	11 53 49.8	+53 41 41	2.44	+0.095	+0.012
Eta CMa	07 24 05.7	-29 18 11	2.45	-0.004	+0.005
Eps Cyg	20 46 12.7	+33 58 13	2.46	+0.356	+0.328
Gam Cas	00 56 42.5	+60 43 00	2.47	+0.026	-0.005
Alp Peg	23 04 45.7	+15 12 19	2.49	+0.063	-0.042
Kap Vel	09 22 06.8	-55 00 39	2.50	-0.008	+0.009
Alp Cet	03 02 16.8	+04 05 23	2.53	-0.009	-0.078
Zet Cen	13 55 32.4	-47 17 18	2.55	-0.057	-0.042
Del Leo	11 14 06.5	+20 31 25	2.56	+0.142	-0.130
Zet Oph	16 37 09.5	-10 34 02	2.56	+0.014	+0.026
Alp Lep	05 32 43.8	-17 49 20	2.58	+0.001	+0.002
Gam Crv	12 10 39.7	-16 59 12	2.59	-0.161	+0.023
Zet Sgr	18 56 15.0	-30 01 23	2.60	-0.015	-0.002

Moto proprio in secondi/anno  
Moto proprio in seconds/year

# OGGETTI MESSIER - MESSIER OBJECTS

Numero Messier	Numero NGC	Nome comune	Tipo di oggetto	Distanza in migliaia di anni luce	Costellazione	Mag. app.
Number Messier	Number NGC	Common name	Type of object	Distance in thousand of light years	Constellation	App. mag.
M1	NGC 1952	Neb del Granchio	Resto di supernova	6,3	Toro	9,0
M2	NGC 7089		Amm. glob.	36	Acquario	7,5
M3	NGC 5272		Amm. glob.	31	Can da Caccia	7,0
M4	NGC 6121		Amm. glob.	7	Scorpione	7,5
M5	NGC 5904		Amm. glob.	23	Serpente	7,0
M6	NGC 6405	Amm. della Farfalla	Amm. ap.	2	Scorpione	4,5
M7	NGC 6475	Amm. di Tolomeo	Amm. ap.	1	Scorpione	3,5
M8	NGC 6523	Neb Laguna	Amm. con Neb	6,5	Sagittario	5,0
M9	NGC 6333		Amm. glob.	26	Ofiuco	9,0
M10	NGC 6254		Amm. glob.	13	Ofiuco	7,5
M11	NGC 6705	Amm. dell'Anitra Selvatica	Amm. ap.	6	Scudo	7,0
M12	NGC 6218		Amm. glob.	18	Ofiuco	8,0
M13	NGC 6205	Amm. glob. di Ercole	Amm. glob.	22	Ercole	7,0
M14	NGC 6402		Amm. glob.	27	Ofiuco	9,5
M15	NGC 7078		Amm. glob.	33	Pegaso	7,5
M16	NGC 6611	Amm. della Neb Aquila	Amm. con Neb	7	Serpente	6,5
M17	NGC 6618	Neb Omega	Amm. con Neb	5	Sagittario	7,0
M18	NGC 6613		Amm. ap.	6	Sagittario	8,0
M19	NGC 6273		Amm. glob.	27	Ofiuco	8,5
M20	NGC 6514	Neb Trifida	Amm. con Neb	2,2	Sagittario	5,0
M21	NGC 6531		Amm. ap.	3	Sagittario	7,0
M22	NGC 6656		Amm. glob.	10	Sagittario	6,5
M23	NGC 6494		Amm. ap.	4,5	Sagittario	6,0
M24	Nessuno, contiene NGC 6603		nube Delle Caustiche	10	Sagittario	11,5
M25	Nessuno, IC 4725		Amm. ap.	2	Sagittario	4,9
M26	NGC 6694		Amm. ap.	5	Scudo	9,5
M27	NGC 6853	Neb Manubrio	Neb planetaria	1,25	Volpetta	7,5
M28	NGC 6626		Amm. glob.	18	Sagittario	8,5
M29	NGC 6913		Amm. ap.	7,2	Cigno	9,0
M30	NGC 7099		Amm. glob.	25	Capricorno	8,5
M31	NGC 224	Galassia di Andromeda	Galassia	2200	Andromeda	4,5
M32	NGC 221		Galassia	2200	Andromeda	10,0
M33	NGC 598	Galassia del Triangolo	Galassia	2300	Triangolo	7,0
M34	NGC 1039		Amm. ap.	1,4	Perseo	6,0
M35	NGC 2168		Amm. ap.	2,8	Gemelli	5,5
M36	NGC 1960		Amm. ap.	4,1	Auriga	6,5
M37	NGC 2099		Amm. ap.	4,6	Auriga	6,0
M38	NGC 1912		Amm. ap.	4,2	Auriga	7,0
M39	NGC 7092		Amm. ap.	0,3	Cigno	5,5
M40	Nessuno		Stella doppia WNC4		Orsa Maggiore	9,0
M41	NGC 2287		Amm. ap.	2,4	Cane Maggiore	5,0
M42	NGC 1976	Neb di Orione	Neb diffusa	1,6	Orione	5,0
M43	NGC 1982	Neb De Mairan (parte della Neb di Orione)	Neb diffusa	1,6	Orione	7,0
M44	NGC 2632	Amm. Alveare	Amm. ap.	0,5	Cancro	4,0
M45	NGC 1432	Pleiadi	Amm. ap.	0,4	Toro	1,4
M46	NGC 2437		Amm. ap.	5,4	Poppa	6,5
M47	NGC 2422		Amm. ap.	1,6	Poppa	4,5
M48	NGC 2548		Amm. ap.	1,5	Idra	5,5
M49	NGC 4472		Galassia	60000	Vergine	10,0
M50	NGC 2323		Amm. ap.	3	Unicorno	7,0
M51	NGC 5194, NGC 5195	Galassia vortice	Galassia	37000	Can da Caccia	8,0
M52	NGC 7654		Amm. ap.	7	Cassiopea	8,0
M53	NGC 5024		Amm. glob.	56	Chioma di Berenice	8,5
M54	NGC 6715		Amm. glob.	83	Sagittario	8,5
M55	NGC 6809		Amm. glob.	17	Sagittario	7,0
M56	NGC 6779		Amm. glob.	32	Lira	9,5
M57	NGC 6720	Neb anello	Neb planetaria	4,1	Lira	9,5
M58	NGC 4579		Galassia	60000	Vergine	11,0
M59	NGC 4621		Galassia	60000	Vergine	11,5
M60	NGC 4649		Galassia	60000	Vergine	10,5
M61	NGC 4303		Galassia	60000	Vergine	10,5
M62	NGC 6266		Amm. glob.	22	Ofiuco	8,0
M63	NGC 5055	Galassia Girasole	Galassia	37000	Can da Caccia	8,5

Numero Messier	Numero NGC	Nome comune	Tipo di oggetto	Distanza in migliaia di anni luce	Costellazione	Mag. app.
Number Messier	Number NGC	Common name	Type of object	Distance in thousand of light years	Constellation	App. mag.
M64	NGC 4826	Galassia Occhio Nero	Galassia	12000	Chioma di Berenice	9,0
M65	NGC 3623		Galassia	35000	Leone	10,5
M66	NGC 3627		Galassia	35000	Leone	10,0
M67	NGC 2682		Amm. ap.	2,25	Cancro	7,5
M68	NGC 4590		Amm. glob.	32	Idra	9,0
M69	NGC 6637		Amm. glob.	25	Sagittario	9,0
M70	NGC 6681		Amm. glob.	28	Sagittario	9,0
M71	NGC 6838		Amm. glob.	12	Freccia	8,5
M72	NGC 6981		Amm. glob.	53	Acquario	10,0
M73	NGC 6994				Acquario	9,0
M74	NGC 628		Galassia	35000	Pesci	10,5
M75	NGC 6864		Amm. glob.	58	Sagittario	9,5
M76	NGC 650, NGC 651	Neb piccola campana muta	Neb planetaria	3,4	Perseo	12,0
M77	NGC 1068		Galassia	60000	Balena	10,5
M78	NGC 2068		Neb diffusa	1,6	Orione	8,0
M79	NGC 1904		Amm. glob.	40	Lepre	8,5
M80	NGC 6093		Amm. glob.	27	Scorpione	8,5
M81	NGC 3031	Galassia di Bode	Galassia	11000	Orsa Maggiore	8,5
M82	NGC 3034	Galassia Sigaro	Galassia	11000	Orsa Maggiore	9,5
M83	NGC 5236	Galassia girandola del sud	Galassia	10000	Idra	8,5
M84	NGC 4374		Galassia	60000	Vergine	11,0
M85	NGC 4382		Galassia	60000	Chioma di Berenice	10,5
M86	NGC 4406		Galassia	60000	Vergine	11,0
M87	NGC 4486	Galassia Virgo A	Galassia	60000	Vergine	11,0
M88	NGC 4501		Galassia	60000	Chioma di Berenice	11,0
M89	NGC 4552		Galassia	60000	Vergine	11,5
M90	NGC 4569		Galassia	60000	Vergine	11,0
M91	NGC 4548		Galassia	60000	Chioma di Berenice	11,5
M92	NGC 6341		Amm. glob.	26	Ercole	7,5
M93	NGC 2447		Amm. ap.	4,5	Poppa	6,5
M94	NGC 4736		Galassia	14500	Can da Caccia	9,5
M95	NGC 3351		Galassia	38000	Leone	11,0
M96	NGC 3368		Galassia	38000	Leone	10,5
M97	NGC 3587	Neb Gufo	Neb planetaria	2,6	Orsa Maggiore	12,0
M98	NGC 4192		Galassia	60000	Chioma di Berenice	11,0
M99	NGC 4254		Galassia	60000	Chioma di Berenice	10,5
M100	NGC 4321		Galassia	60000	Chioma di Berenice	10,5
M101	NGC 5457	Galassia girandola	Galassia	24000	Orsa Maggiore	8,5
M102		Galassia Fuso	Galassia	40000	Dragone	10,5
M103	NGC 581		Amm. ap.	8	Cassiopea	7,0
M104	NGC 4594	Galassia Sombbrero	Galassia	50000	Vergine	9,5
M105	NGC 3379		Galassia	38000	Leone	11,0
M106	NGC 4258		Galassia	25000	Can da Caccia	9,5
M107	NGC 6171		Amm. glob.	20	Ofiuco	10,0
M108	NGC 3556		Galassia	45000	Orsa Maggiore	11,0
M109	NGC 3992		Galassia	55000	Orsa Maggiore	11,0
M110	NGC 205		Galassia	2200	Andromeda	10,0

# VISIBILITA' OGGETTI MESSIER

## VISIBILITY MESSIER OBJECTS

Catalogo Messier	Costellazione	Oggetto	Mesi di visibilità
Catalog Messier	Constellation	Object	Months of visibility
M1	Toro	Nebulosa diffusa	XII-II
M2	Acquario	Ammasso globulare	X-XII
M3	Cani da Caccia	Ammasso globulare	I-IX
M4	Scorpione	Ammasso globulare	VII-VIII
M5	Serpente	Ammasso globulare	VII-X
M6	Scorpione	Ammasso aperto	VII-VIII
M7	Scorpione	Ammasso aperto	VII-VIII
M8	Sagittario	Nebulosa diffusa	VIII-IX
M9	Ofiuco	Ammasso globulare	VII-VIII
M10	Ofiuco	Ammasso globulare	VII-VIII
M11	Scudo	Ammasso aperto	VII-IX
M12	Ofiuco	Ammasso globulare	VII-VIII
M13	Ercole	Ammasso globulare	VI-IX
M14	Ofiuco	Ammasso globulare	VII-VIII
M15	Pegaso	Ammasso globulare	VIII-X
M16	Serpente	Nebulosa/ammasso	VII-X
M17	Sagittario	Nebulosa diffusa	VIII-IX
M18	Sagittario	Ammasso aperto	VIII-IX
M19	Ofiuco	Ammasso globulare	VII-VIII
M20	Sagittario	Nebulosa diffusa	VIII-IX
M21	Sagittario	Ammasso aperto	VIII-IX
M22	Sagittario	Ammasso globulare	VIII-IX
M23	Sagittario	Ammasso aperto	VIII-IX
M24	Sagittario	Ammasso aperto	VIII-IX
M25	Sagittario	Ammasso aperto	VIII-IX
M26	Scudo	Ammasso aperto	VII-IX
M27	Volpetta	Nebulosa planetaria	VIII-X
M28	Sagittario	Ammasso globulare	VIII-IX
M29	Cigno	Ammasso aperto	VIII-X
M30	Capricorno	Ammasso globulare	IX-X
M31	Andromeda	Galassia	X-XII
M32	Andromeda	Galassia	X-XII
M33	Triangolo	Galassia	X-XII
M34	Perseo	Ammasso aperto	X-XII
M35	Gemelli	Ammasso aperto	I-III
M36	Auriga	Ammasso aperto	I-III
M37	Auriga	Ammasso aperto	I-III
M38	Auriga	Ammasso aperto	I-III
M39	Cigno	Ammasso aperto	VIII-X
M40			
M41	Cane maggiore	Ammasso aperto	XII-III

Catalogo Messier	Costellazione	Oggetto	Mesi di visibilità
Catalog Messier	Constellation	Object	Months of visibility
M42	Orione	Nebulosa diffusa	XII-III
M43	Orione	Nebulosa diffusa	XII-III
M44	Cancro	Ammasso aperto	II-V
M45	Toro	Ammasso aperto	XII-II
M46	Poppa	Ammasso aperto	II-IV
M47	Poppa	Ammasso aperto	II-IV
M48	Idra	Ammasso aperto	IV-VI
M49	Vergine	Galassia	V-VII
M50	Unicorno	Ammasso aperto	II-IV
M51	Cani da caccia	Galassia	I-IX
M52	Cassiopea	Ammasso aperto	circumpolare
M53	Chioma Berenice	Ammasso globulare	VI-VIII
M54	Sagittario	Ammasso globulare	VIII-IX
M55	Sagittario	Ammasso globulare	VIII-IX
M56	Lira	Ammasso globulare	VII-IX
M57	Lira	Nebulosa planetaria	VII-IX
M58	Vergine	Galassia	V-VII
M59	Vergine	Galassia	V-VII
M60	Vergine	Galassia	V-VII
M61	Vergine	Galassia	V-VII
M62	Ofiuco	Ammasso globulare	VII-VIII
M63	Cani da caccia	Galassia	I-IX
M64	Chioma Berenice	Galassia	IV-VIII
M65	Leone	Galassia	III-IV
M66	Leone	Galassia	III-IV
M67	Cancro	ammasso aperto	II-V
M68	Cancro	Ammasso globulare	IV-VI
M69	Idra	Ammasso globulare	VIII-IX
M70	Sagittario	Ammasso globulare	VIII-IX
M71	Sagittario	Ammasso globulare	VIII-X
M72	Acquario	Ammasso globulare	X-XII
M73	Acquario	ammasso aperto	X-XII
M74	Pesci	Galassia	X-XII
M75	Sagittario	Ammasso globulare	VIII-IX
M76	Perseo	Nebulosa planetaria	IX-IV
M77	Balena	Galassia	XI-I
M78	Orione	Nebulosa diffusa	XII-III
M79	Lepre	Ammasso globulare	XII-III
M80	Scorpione	Ammasso globulare	VII-VIII
M81	Orsa maggiore	Galassia	circumpolare
M82	Orsa maggiore	Galassia	circumpolare
M83	Idra	Galassia	IV-VI
M84	Vergine	Galassia	V-VII
M85	Chioma Berenice	Galassia	VI-VII
M86	Vergine	Galassia	V-VII

Catalogo Messier	Costellazione	Oggetto	Mesi di visibilità
Catalog Messier	Constellation	Object	Months of visibility
M87	Vergine	Galassia	V-VII
M88	Chioma Berenice	Galassia	VI-VII
M89	Vergine	Galassia	V-VII
M91	Chioma Berenice	Galassia	VI-VIII
M92	Ercole	Ammasso globulare	VI-IX
M93	Poppa	Ammasso aperto	II-IV
M94	Cani da Caccia	Galassia	I-IX
M95	Leone	Galassia	III-IV
M96	Leone	Galassia	III-IV
M97	Orsa Maggiore	Nebulosa planetaria	circumpolare
M98	Chioma Berenice	Galassia	VI-VIII
M99	Chioma Berenice	Galassia	VI-VIII
M100	Chioma Berenice	Galassia	VI-VIII
M101	Orsa Maggiore	Galassia	circumpolare
M102			
M103	Cassiopea	Ammasso aperto	circumpolare
M104	Vergine	Galassia	V-VII
M105	Leone	Galassia	III-IV
M106	Cani da Caccia	Galassia	I-IX
M107	Ofiuco	Ammasso globulare	VII-VIII
M108	Orsa Maggiore	Galassia	circumpolare
M109	Orsa Maggiore	Galassia	circumpolare
M110	Andromeda	Galassia	X-XII

# STELLE DOPPIE DI MAG.<6

## DOUBLE STARS WITH MAG.<6

COS	NOME	A.R.	DEC.	COMP	ALTRO NOME	Mag	Mag2	SEP	PA
AND	56 And	01 56.2	+37 15			5.7	6	190	300
AND	Gamma And	02 03.9	+42 20		Almach	2.3	5.5	9.8	63
AQR	Zeta Agr	22 28.8	-00 01			4.3	4.5	2.3	183
ARI	Epsilon Ari	02 59.2	+21 20	AB		5.2	5.5	1.5	208
ARI	Gamma Ari	01 53.5	+19 18		Mesarthim	4.8	4.8	7.8	0
BOO	Epsilon Boo	14 45.0	+27 04		Izar	2.5	4.9	2.8	339
BOO	Pi Boo	14 40.7	+16 25			4.9	5.8	5.6	108
BOO	Zeta Boo	14 41.1	+13 44			4.5	4.6	1	307
CAM	32 Cam	12 49.2	+83 25		STF 1694	5.3	5.8	21.6	326
CAP	Alpha1/2 Cap	20 18.1	-12 33		Algedi	3.6	4.2	378	291
CAR	Upsilon Car	09 47.1	-65 04			3.2	6	5	128
CEN	3 Cen	13 51.8	-33 00		K Cen	4.5	6	11.9	112
CEN	Alpha Cen	14 39.7	-60 50			0	1.5	9.4	233
CEN	Beta Cen	14 03.9	-60 23			0.7	3.9	1.3	251
CNC	Zeta Cnc	08 12.2	+17 39	AB		5.6	6	6	72
CRA	Gamma CrA	19 06.4	-37 04		h 5084	4.8	5.1	1.3	54
CRA	h 5014	18 06.8	-43 25			5.8	5.8	1.6	221
CRB	Eta CrB	15 23.2	+30 17	AB		5.6	5.9	0.5	128
CRB	Nu1 CrB	16 22.4	+33 48		2 CrB	5.4	5.3	364.4	165
CRB	Zeta2 CrB	15 39.4	+36 38		STF 1965	5.1	6	6.3	305
CRU	Alpha Cru	12 26.6	-63 06	AB		1.4	1.9	4.1	111
CRU	Alpha Cru	12 26.6	-63 06	AC		1.4	4.9	90.1	202
CRU	Mu Cru	12 54.6	-57 11			4	5.2	34.9	17
CVN	Alpha CVn	12 56.0	+38 19		Cor Caroli	2.9	5.5	19.4	229
CYG	61 Cyg	21 06.9	+38 45			5.2	6	28	144
CYG	Beta Cyg	19 30.7	+27 58		Albireo	3.1	5.1	34.4	54
CYG	Omicron1 Cyg	20 13.6	+46 44	AD	31 Cygni2	4	5	338	338
DEL	Gamma Del	20 46.7	+16 07			4.5	5.5	9.6	268
DRA	Mu Dra	17 05.3	+54 28			5.7	5.7	2.3	10
DRA	Nu Dra	17 32.2	+55 11		Kuma	4.9	4.9	62	312
EQU	Delta Equ	21 14.5	+10 00	AB	STF 535	5.2	5.3		25
EQU	Gamma Equ	21 10.3	+10 08			4.7	5.9	353	153
ERI	Dunlop 16	03 48.6	-37 37		f Eri	4.8	5.3	7.9	212
ERI	Rho Eri	01 39.8	-56 12		p Eri	5.8	5.8	11.4	191
ERI	STF 470	03 54	-02 57			4.5	5.7	6.9	348
ERI	Theta Eri	02 58.3	-40 18		Acamar	3.4	4.5	8.2	88
GEM	Alpha Gem	07 34.6	+31 53		Castor	1.9	2.9	2.2	164
HER	100 Her	18 07.8	+26 06		STF 2280	5.9	6	14.2	183
HER	95 Her	18 01.5	+21 35		STF 2264	5.1	5.2	6.3	258
HER	Alpha Her	17 14.6	+14 23		Ras Algethi	3.5	5.4	4.7	107
HER	Rho Her	17 23.7	+37 09			4.6	5.6	4.1	316
HER	Zeta Her	16 41.3	+31 36			2.9	5.5	1.1	210
HYA	Beta Hya	11 52.9	-33 54			4.7	5.5	0.9	8
HYA	Epsilon Hya	08 46.8	+06 25	AB		3.8	4.7	2.7	113
HYA	N Hya	11 32.3	-29 16		17 Crt; H 96	5.8	5.9	9.2	210
LEO	Gamma Leo	10 20.0	+19 51		Algieba	2.2	3.5	4.4	122
LIB	Alpha Lib	14 50.9	-16 02		Zubenelgenubi	2.8	5.2	231	314
LIB	Sh 179	14 25.5	-19 58			6	6	35	295
LUP	Mu Lup	15 15.0	-47 42			4.8	5.2	1.6	150
LUP	Pi Lup	15 01.7	-46 51		h 4728	4.7	4.8	1.5	78
LUP	Xi Lup	15 56.9	-34 58			5.3	5.8	10.4	49
LYN	12 Lyn	06 46	+59 26	AB	STF 948	5.5	6	1.8	73
LYN	15 Lyn	06 57.3	+58 25	AB		4.8	5.9	0.9	33
LYR	Delta1/2 Lyr	18 54.5	+36 54			5.6	4.5	630	115
LYR	Epsilon2 Lyr	18 44.3	+39 40	CD		5.2	5.5	2.3	94
LYR	Zeta2 Lyr	18 44.8	+37 36			4.3	5.9	43.7	150
MON	Beta Mon	06 28.8	-07 02	AB	11 Mon	4.7	5.2	7.3	132
MUS	Beta Mus	12 46.3	-68 06			3.9	4.2	1.3	4
OPH	36 Oph	17 15.3	-26 36			5.1	5.1	4.8	
OPH	70 Oph	18 05.5	+02 30			4.2	6	5.2	136
OPH	Eta Oph	17 10.4	-15 43		Sabik	3	3.5	1	325
OPH	Lambda Oph	16 30.9	+01 59		Marfik	4.2	5.2	1.6	35
OPH	Rho Oph	16 25.6	-23 27		5 Oph	5.3	6	3.1	344
OPH	Tau Oph	18 03.1	-08 11			5.2	5.9	1.6	286
ORI	42/45 Ori	05 35.4	-04 50			4.7	5.3	252	105
ORI	Eta Ori	05 24.5	-02 24			3.8	4.8	1.5	77
ORI	Lambda Ori	05 35.1	+09 56		Meissa	3.6	5.5	4.4	43
ORI	Lambda Ori	05 35.4	+09 56	AB		4	6	4.4	44
ORI	Sh 49	04 59.2	+14 32	AB		5	6	39.4	305
ORI	Sigma Ori	05 38.7	-02 36	AB		4	6	0.2	
ORI	STF 747	05 35.0	-06 00			4.8	5.7	35.7	223
ORI	Theta1/2 Ori	05 35.4	-05 25			4.9	5	135	314
ORI	Zeta Ori	05 40.8	-01 57	AB	Alnitak	1.9	4	2.4	162

PAV	L 8550	20 51.6	-62 26		RMK 26	5.8	5.8	2.7	93
PHE	Beta Phe	01 06.1	-46 43			4.1	4.2	0.7	307
PSC	Alpha Psc	02 02.0	+02 46		Al Risha (Alrescha)	4.2	5.1	1.8	267
PSC	Psil Psc	01 05.6	+21 28			5.6	5.8	30	159
PUP	Dunlop 67	08 14.0	-36 19			5.1	6	67.4	175
PUP	H N 19	07 34.3	-23 28		South 552	5.8	5.9	9.3	114
PUP	Kappa Pup	07 38.8	-26 48	AB	Markeb	3.8	4	8.8	318
SCO	Alpha Sco	16 29.4	-26 26		Antares	1.2	5.4	2.9	275
SCO	Beta Sco	16 05.4	-19 48		Graffias	2.6	4.9	13.6	21
SCO	Xi Sco	16 04.4	-11 22	AB	STF 1998	4.8	5.1	0.5	358
SER	Delta Ser	15 34.5	+10 32			4.2	5.2	3.9	178
SER	STF 2375	18 45.5	+05 30			5.8	5.8	2.6	119
SER	Theta1/2 Ser	18 56.2	+04 12	AB	Alya	4	5	22	104
TAU	27 Tau	03 49.2	+24 03		Atlas; H N 870	3.7	5	300	180
TAU	Kappa Tau	04 25.4	+22 18			4.4	5.4	340	173
TAU	Theta Tau	04 28.7	+15 52			3.4	3.8	337.4	346
TUC	Beta Tuc	00 31.5	-62 58			4.5	4.5	27.1	170
UMA	Xi UMa	11 18.2	+31 32		Alula Australis	4.3	4.8	1.6	273
UMA	Zeta UMa	13 23.9	+54 56		Mizar/Alcor; STF 1744	2.3	4	14.4	150
VEL	Gamma2 Vel	08 09.6	-47 20	AB	Regor; Dunlop 65	2.2	4.5	41.2	220
VIR	Gamma Vir	12 41.7	-01 27		Porrima; STF 1070	3.5	3.5	0.6	209
VOL	Gamma Vol	07 08.8	-70 30			3.9	5.8	13.7	297
VUL	6/8 Vul	19 28.7	+24 40			4.4	5.8	413.7	28



# STELLE VARIABILI CON MAX MAG.<6

## VARIABLE STARS WITH MAX MAG.<6

GCVS	Cos	A.R.	J2000	DEC.	J2000	magMax	Periodo	GCVS	Cos	A.R.	J2000	DEC.	J2000	magMax	Periodo
R	And	00 24 01.9	+38 34 37	5.800	409.3300000			omi 1	Cen	11 31 46.1	-59 26 31	5.800	200.0000000		
S	And	00 42 43.1	+41 16 05	5.800				LZ	Cep	22 02 04.6	+58 00 01	5.560	3.0705100		
AN	And	23 18 23.3	+41 46 25	6.000	3.2195665			V0381	Cep	21 19 15.7	+58 37 25	5.510			
KK	And	01 34 16.6	+37 14 14	5.910	0.6684000			V0388	Cep	23 15 37.7	+70 53 17	5.560			
OP	And	01 36 27.2	+48 43 22	5.920				V0414	Cep	20 44 22.1	+56 29 18	5.870			
OU	And	23 49 41.0	+36 25 31	5.900				AB	Cet	02 26 00.3	-15 20 28	5.710	2.9978140		
PZ	And	02 20 58.2	+50 09 05	5.590				BK	Cet	01 52 52.1	-16 55 45	5.730			
V0340	And	23 34 37.5	+40 14 11	5.590				EL	Cet	03 12 26.4	+06 39 39	5.660			
V0388	And	23 27 07.4	+42 54 43	5.730				DR	Cha	10 41 51.5	-79 47 00	5.940			
NO	Aps	17 31 27.5	-80 51 33	5.710				AX	Cir	14 52 35.3	-63 48 35	5.650	5.2732680		
R	Aqr	23 43 49.5	-15 17 04	5.800	386.9600000			CO	Cir	14 48 44.6	-66 35 37	5.790			
DV	Aqr	20 58 41.8	-14 28 59	5.890	1.5755310			SW	Col	05 23 24.0	-39 40 42	5.710			
HI	Aqr	22 53 28.7	-11 36 59	5.800				V0701	CrA	19 03 17.7	-38 15 11	5.690			
R	Aql	19 06 22.3	+08 13 48	5.500	284.2000000			V0710	CrA	19 01 50.7	-36 58 10	5.840			
EL	Aql	18 56 02.0	-03 19 20	5.500				R	CrB	15 48 34.4	+28 09 24	5.710			
QS	Aql	19 41 05.5	+13 48 56	5.930	2.5132940			S	CrB	15 21 24.0	+31 22 03	5.800	360.2600000		
V0606	Aql	19 20 24.3	-00 08 02	5.500				TZ	CrB	16 14 40.9	+33 51 31	5.690	1.1397890		
V1208	Aql	19 19 39.3	+12 22 29	5.510	0.1496630			DS	Cru	12 51 18.0	-60 19 47	5.790			
V1286	Aql	18 58 46.9	+13 54 24	5.830	6.0500000			U	Cyg	20 19 36.6	+47 53 39	5.900	463.2400000		
V1291	Aql	19 53 18.7	-03 06 52	5.610	224.5000000			X	Cyg	20 43 24.2	+35 35 16	5.850	16.3863320		
V1363	Aql	18 51 26.3	-01 03 52	5.800				RT	Cyg	19 43 37.8	+48 46 41	6.000	190.2800000		
V1370	Aql	19 23 21.1	+02 29 26	6.000				CH	Cyg	19 24 33.1	+50 14 29	5.600			
R	Ara	16 39 44.7	-56 59 40	6.000	4.4250700			DT	Cyg	21 06 30.2	+31 11 05	5.570	2.4992150		
V0539	Ara	17 50 28.4	-53 36 45	5.660	3.1691280			V0380	Cyg	19 50 37.3	+40 35 59	5.610	12.4256120		
V0854	Ara	17 11 38.7	-48 52 24	5.870				V0389	Cyg	21 08 38.9	+30 12 20	5.550			
V0862	Ara	17 31 23.3	-56 55 15	5.920				V0460	Cyg	21 42 01.1	+35 30 37	5.570	180.0000000		
RZ	Ari	02 55 48.5	+18 19 54	5.620	30.0000000			V1143	Cyg	19 38 41.2	+54 58 26	5.850	7.6407613		
SX	Ari	03 12 14.2	+27 15 25	5.670	0.7278925			V1334	Cyg	21 19 22.2	+38 14 15	5.770	3.3328160		
VZ	Ari	02 48 45.9	+25 11 17	5.820				V1339	Cyg	21 42 08.4	+45 45 57	5.900	35.0000000		
AV	Ari	02 10 37.6	+19 30 01	5.680				V1610	Cyg	21 02 18.7	+36 41 41	5.800			
WW	Aur	06 32 27.2	+32 27 18	5.790	2.5250192			V1668	Cyg	21 42 35.3	+44 01 55	6.000			
AE	Aur	05 16 18.1	+34 18 44	5.780				V1679	Cyg	20 14 31.8	+36 39 40	5.990			
OX	Aur	06 53 01.4	+38 52 09	5.940	0.1544120			V1743	Cyg	19 33 41.6	+49 15 44	5.960	40.0000000		
PU	Aur	05 18 15.7	+42 47 32	5.640				V1762	Cyg	19 08 25.8	+52 25 33	5.810			
QZ	Aur	05 28 34.1	+33 18 22	6.000				V1768	Cyg	20 04 36.2	+32 13 07	5.560			
V0444	Aur	06 00 58.6	+47 54 07	5.700				V2015	Cyg	20 33 54.8	+46 41 38	5.620			
CH	Boo	14 34 39.6	+49 22 06	5.740				V2093	Cyg	19 50 46.9	+37 49 35	6.000			
CY	Boo	14 17 28.5	+15 15 48	5.740				V2119	Cyg	20 23 44.4	+37 28 35	5.740			
DE	Boo	14 53 23.8	+19 09 10	6.000				V2121	Cyg	20 27 02.2	+49 23 00	5.750			
i	Boo	15 03 47.3	+47 39 15	5.800	0.2678159			V2140	Cyg	20 55 49.8	+47 25 04	5.650			
AX	Cam	08 01 42.5	+60 19 28	5.950	8.0278000			V2157	Cyg	21 25 47.0	+36 40 03	5.870			
DL	Cam	04 32 01.8	+53 54 39	5.810				EU	Del	20 37 54.7	+18 16 07	5.790	59.7000000		
X	Cnc	08 55 22.9	+17 13 53	5.600	195.0000000			UX	Dra	19 21 35.5	+76 33 35	5.940	168.0000000		
BI	Cnc	08 44 45.0	+10 04 54	5.580	4.2359000			VW	Dra	17 16 29.4	+60 40 14	6.000	170.0000000		
BL	Cnc	08 06 18.4	+22 38 08	5.970				CX	Dra	18 46 43.1	+52 59 17	5.680			
BM	Cnc	08 13 08.9	+29 39 24	5.530	4.1160000			DE	Dra	20 19 36.7	+62 15 27	5.720	5.2980360		
BO	Cnc	08 52 28.6	+28 15 33	5.900				DQ	Dra	16 24 25.3	+55 12 18	5.740			
TU	CVn	12 54 56.5	+47 11 48	5.550	50.0000000			EE	Dra	18 58 52.6	+69 31 53	5.840			
AI	CVn	12 23 47.0	+42 32 34	5.890	0.2085000			R	Eri	04 55 18.6	-16 25 04	5.720			
R	CMa	07 19 28.2	-16 23 43	5.700	1.1359405			DO	Eri	03 55 16.1	-12 05 57	5.970	12.4580000		
FV	CMa	07 07 22.6	-23 50 27	5.640				DX	Eri	04 44 05.3	-08 30 13	5.760			
FY	CMa	07 26 59.5	-23 05 10	5.540				DZ	Eri	04 32 37.6	-03 12 34	5.730	1.3740000		
HZ	CMa	06 50 23.3	-31 42 22	5.690				EH	Eri	04 33 54.7	-06 44 20	5.720	3.8200000		
IY	CMa	06 28 39.2	-32 22 17	5.640				EM	Eri	04 20 42.8	-07 35 33	5.840			
LS	CMa	07 01 05.9	-25 12 56	5.570				GW	Eri	04 11 36.2	-20 21 22	5.840			
LZ	CMa	07 09 43.0	-25 13 52	5.630				GZ	Eri	04 18 16.1	-20 42 55	5.940			
MM	CMa	07 12 12.2	-25 56 33	5.840				S	For	03 46 13.2	-24 23 28	5.600			
MZ	CMa	07 21 04.3	-25 53 30	5.870				AI	For	03 19 34.9	-24 07 22	5.650			
NR	CMa	07 27 08.0	-17 51 53	5.670				R	Gem	07 07 21.3	+22 42 13	6.000	369.9100000		
AG	Cap	21 46 16.3	-09 16 33	5.900	25.0000000			BU	Gem	06 12 19.1	+22 54 31	5.740			
U	Car	10 57 48.2	-59 43 56	5.720	38.7681000			NP	Gem	07 02 25.5	+17 45 20	5.890			
QY	Car	10 11 46.5	-58 03 38	5.630				NZ	Gem	07 42 03.2	+14 12 31	5.520			
V0366	Car	09 54 43.4	-57 18 52	5.700	433.0000000			OT	Gem	07 24 27.6	+15 31 02	6.000			
V0372	Car	07 52 29.7	-54 22 02	5.690	0.1160000			OV	Gem	06 49 49.8	+16 12 10	5.850			
V0374	Car	07 58 50.6	-60 49 28	5.720				PU	Gem	06 09 44.0	+23 06 48	5.780			
V0448	Car	06 47 18.7	-55 32 24	5.660				S	Gru	22 26 05.5	-48 26 19	6.000	401.5100000		
V0482	Car	09 30 23.4	-58 21 43	5.850				DL	Gru	23 10 09.7	-40 35 30	5.860			
V0514	Car	10 38 02.6	-57 15 23	5.830				LQ	Her	16 11 38.0	+23 29 41	5.580			
RU	Cas	01 11 41.4	+65 01 08	5.500				OP	Her	17 56 48.5	+45 21 03	5.850	120.5000000		
SU	Cas	02 51 58.8	+68 53 19	5.700	1.9493190			V0636	Her	16 47 19.7	+42 14 20	5.830			
YZ	Cas	00 45 39.1	+74 59 17	5.710	4.4672240			V0640	Her	17 25 54.4	+16 55 03	5.980			
V0373	Cas	23 55 33.8	+57 24 44	5.900	13.4192000			V0819	Her	17 21 43.6	+39 58 29	5.510			
V0557	Cas	01 42 20.5	+68 02 35	5.550	3.1848000			V0839	Her	15 55 30.6	+42 33 58	5.740			
V0567	Cas	00 05 06.1	+61 18 50	5.710	6.4322000			TU	Hor	03 30 37.0	-47 22 30	5.900	0.9359710		
V0638	Cas	23 02 43.9	+55 14 11	5.700	5.3600000			HW	Hor	03 12 33.2	-57 19 18	5.520	158.0000000		
V0640	Cas	00 06 15.8	+58 26 12	5.960				TV	Hya	08 35 28.2	-07 58 56	5.660	5.5700000		
V0705	Cas	23 41 47.2	+57 31 01	5.800				LM	Hya	08 26 27.2	-03 59 15	5.800			
V0746	Cas	00 24 15.7	+52 01 12	5.540				V0335	Hya	12 13 12.9	-34 07 31	5.840			
V0762	Cas	01 16 11.9	+71 44 38	5.920				khi 2	Hya	11 05 57.6	-27 17 16	5.650	2.2677010		
T	Cen	13 41 45.6	-33 35 51	5.500	90.4400000			BN	Hyi	03 07 32.1	-78 59 21	5.700			
V0716	Cen	14 13 39.8	-54 37 32	5.960	1.4900960			V0360	Lac	22 50 21.8	+41 57 12	5.910	10.0750000		
V0763	Cen	11 35 13.3	-47 22 21	5.550	60.0000000			TX	Leo	10 35 02.2	+08 39 02	5.660	2.4450566		
V0767	Cen	13 53 57.2	-47 07 41	5.860				VY	Leo	10 56 01.5	+06 11 07	5.690			
V0768	Cen	14 48 38.0	-36 38 05	5.930				CX	Leo	10 27 39.0	+09 45 45	5.970	7.8970000		
V0788	Cen	12 08 53.8	-44 19 34	5.740	4.9663770			DE	Leo	10 25 15.2	+08 47 05	5.600			
V0869	Cen	14 09 35.0	-51 30 17	5.920				DR	Leo	09 41 35.1	+31 16 40	5.840			
V0893	Cen	14 00 29.3													

GCVS	Cos	A.R. J2000	DEC.J2000	magMax	Periodo
R	Lep	04 59 36.3	-14 48 23	5.500	427.0700000
S	Lep	06 05 45.5	-24 11 44	6.000	89.0000000
YY	Lep	06 06 57.5	-21 48 44	5.600	
HR	Lup	15 08 12.1	-40 35 02	5.760	
HZ	Lup	15 06 33.2	-30 55 07	5.960	
RR	Lyn	06 26 25.8	+56 17 06	5.520	9.9450790
XY	Lyr	18 38 06.5	+39 40 06	5.800	
V0471	Lyr	19 11 46.0	+31 17 00	5.910	1.1608980
V0473	Lyr	19 15 59.5	+27 55 35	5.990	1.4907800
V0542	Lyr	18 58 01.9	+38 15 58	5.830	
WX	Men	05 34 44.8	-73 44 29	5.720	
iot	Men	05 35 36.2	-78 49 15	6.000	5.2880000
T	Mon	06 25 13.0	+07 05 09	5.580	27.0246490
V	Mon	06 22 43.6	-02 11 43	6.000	340.5000000
V0474	Mon	05 59 01.1	-09 22 56	5.930	0.1361260
R	Mus	12 42 05.0	-69 24 27	5.930	7.5102110
S	Mus	12 12 47.0	-70 09 06	5.890	9.6600700
BO	Mus	12 34 54.4	-67 45 25	5.850	
LS	Mus	13 03 05.4	-71 28 33	5.900	
tet	Mus	13 08 07.2	-65 18 22	5.500	18.3410000
V0360	Nor	15 51 06.8	-55 03 20	5.770	
V0367	Nor	16 13 17.0	-53 40 16	5.940	
U	Oph	17 16 31.7	+01 12 38	5.840	1.6773461
X	Oph	18 38 21.1	+08 50 03	5.900	328.8500000
Y	Oph	17 52 38.7	-06 08 37	5.870	17.1241300
V2052	Oph	17 56 18.4	+00 40 13	5.810	0.1398903
V2347	Oph	18 27 51.0	+07 52 21	5.800	
CK	Ori	05 30 19.9	+04 12 17	5.900	120.0000000
V0529	Ori	05 58 20.2	+20 15 45	6.000	
V1004	Ori	05 58 24.4	+01 50 14	5.880	0.0611000
AG	Peg	21 51 02.0	+12 37 32	6.000	
HH	Peg	23 51 21.2	+09 18 48	5.740	
HN	Peg	21 44 31.3	+14 46 19	5.920	24.9000000
HV	Peg	23 27 40.4	+25 10 02	5.960	6.9700000
IM	Peg	22 53 02.3	+16 50 28	5.600	24.4400000
MR	Peg	22 54 12.1	+22 39 35	5.710	
NV	Peg	21 28 59.8	+22 10 46	5.660	
NZ	Peg	21 39 01.2	+20 15 56	5.830	
V0342	Peg	23 07 28.7	+21 08 03	6.000	
IW	Per	03 33 35.0	+39 53 58	5.790	0.9171877
V0376	Per	03 49 08.1	+43 57 47	5.770	0.0993700
V0472	Per	02 08 40.6	+58 25 25	5.640	
V0582	Per	04 08 36.6	+38 02 23	5.630	
BD	Phe	01 50 54.4	-50 12 22	5.900	
ksi	Phe	00 41 46.4	-56 30 05	5.680	3.9516000
VX	Psc	01 29 52.9	+18 21 20	5.900	0.1310000
WW	Psc	00 59 49.7	+06 29 00	5.970	
XZ	Psc	23 54 46.6	+00 06 34	5.610	
AG	Psc	00 36 47.3	+15 13 54	5.810	0.0800000
UU	PsA	22 04 36.8	-26 49 21	5.860	
VZ	PsA	22 38 51.5	-33 04 53	5.680	
WX	PsA	22 59 35.8	-29 27 44	5.570	
MY	Pup	07 38 18.2	-48 36 05	5.540	5.6948200
PR	Pup	07 14 46.0	-46 50 59	5.690	1.9347000
PT	Pup	07 36 41.0	-19 42 08	5.720	0.1628400
QS	Pup	07 49 12.9	-46 51 28	5.840	0.1182000
V0336	Pup	08 02 44.8	-41 18 35	5.520	
V0363	Pup	07 12 25.8	-36 32 40	5.890	
V0378	Pup	07 36 03.9	-14 29 34	5.600	
V0390	Pup	07 44 34.2	-24 40 27	5.530	
V0392	Pup	07 46 10.5	-37 56 01	5.820	
V0397	Pup	07 49 14.7	-35 14 36	5.910	
V0438	Pup	08 24 57.2	-42 46 11	5.900	
V0468	Pup	07 39 58.0	-37 34 46	5.920	
XY	Pyx	08 27 59.4	-35 06 50	5.680	
RT	Sgr	20 17 43.6	-39 06 46	6.000	306.4600000
RU	Sgr	19 58 42.9	-41 50 58	6.000	240.4900000
RY	Sgr	19 16 32.8	-33 31 20	5.800	
V0732	Sgr	17 56 07.5	-27 22 17	6.000	
V3970	Sgr	17 58 30.0	-29 13 08	6.000	350.0000000
V3974	Sgr	17 58 57.0	-28 50 54	5.890	450.0000000

GCVS	Cos	A.R. J2000	DEC.J2000	magMax	Periodo
V3999	Sgr	18 02 19.0	-29 59 15	5.670	470.0000000
V4001	Sgr	18 02 42.0	-30 05 25	5.770	465.0000000
V4037	Sgr	18 02 35.0	-29 59 56	5.740	400.0000000
V4089	Sgr	19 34 08.4	-40 02 05	5.870	
V4452	Sgr	17 44 29.4	-29 04 59	5.930	
V4501	Sgr	17 45 31.5	-28 46 22	5.910	
V4530	Sgr	17 45 56.1	-28 55 51	5.570	
V4531	Sgr	17 45 55.8	-28 45 18	5.810	
V0906	Sco	17 53 54.8	-34 45 10	5.960	2.7858470
V0923	Sco	17 03 50.9	-38 09 09	5.860	34.8269000
V0927	Sco	15 54 39.5	-25 14 37	5.800	1.4593700
V0929	Sco	16 06 06.4	-23 36 23	5.890	
V0957	Sco	17 52 13.7	-34 47 57	5.870	
V1003	Sco	16 38 26.3	-43 23 54	5.830	
V1036	Sco	17 34 42.5	-32 34 54	5.710	
V1068	Sco	16 53 42.4	-43 03 03	5.710	
V1075	Sco	17 15 19.2	-33 32 54	5.570	
S	Scl	00 15 22.3	-32 02 43	5.500	362.5700000
AI	Scl	01 12 45.4	-37 51 23	5.890	
BU	Scl	23 59 27.9	-29 29 07	5.700	
sig	Scl	01 02 26.4	-31 33 07	5.500	
V0373	Sct	18 55 27.0	-07 43 05	6.000	
V0432	Sct	18 29 46.8	-14 34 55	5.960	2.1912000
CT	Ser	15 45 39.1	+14 22 32	6.000	
FL	Ser	15 12 04.3	+18 58 34	5.790	
FS	Ser	16 08 28.1	+08 32 04	5.680	
tau 4	Ser	15 36 28.2	+15 06 05	5.890	100.0000000
SS	Sex	10 23 27.0	-04 04 27	5.940	4.3700000
TU	Tau	05 45 13.7	+24 25 12	5.900	190.0000000
XX	Tau	05 19 24.4	+16 43 00	6.000	
HU	Tau	04 38 15.8	+20 41 05	5.850	2.0562997
V0483	Tau	04 19 57.7	+14 02 07	5.550	0.0540000
V0711	Tau	03 36 47.3	+00 35 16	5.710	2.8406120
V0731	Tau	05 43 19.5	+23 12 16	5.980	
V0775	Tau	04 22 03.5	+14 04 38	5.720	0.0625000
V0809	Tau	05 52 22.3	+14 10 18	5.590	2.6541000
V0892	Tau	04 18 40.6	+28 19 16	5.550	
V0960	Tau	05 33 31.6	+18 32 25	5.530	
V1083	Tau	03 43 43.9	+06 55 30	5.990	
V1141	Tau	04 23 32.4	+20 58 55	6.000	
V1155	Tau	05 07 55.4	+21 42 17	5.820	
V1156	Tau	05 09 45.1	+28 01 50	6.000	
PW	Tel	19 33 21.6	-45 16 18	5.610	2.9213000
YY	Tri	02 18 06.0	+28 36 45	5.840	
S	TrA	16 01 10.7	-63 46 36	5.950	6.3234400
LX	TrA	15 27 33.1	-64 31 53	5.810	
MX	TrA	16 59 34.0	-69 16 05	5.750	
BQ	Tuc	00 53 37.9	-62 52 17	5.700	
CG	Tuc	23 29 01.0	-63 06 38	5.660	2.3148000
ST	UMa	11 27 50.4	+45 11 07	6.000	110.0000000
VY	UMa	10 45 04.0	+67 24 41	5.870	
CO	UMa	11 09 19.1	+36 18 34	5.740	
CR	UMa	13 46 35.7	+54 25 58	5.650	1.3799600
EN	UMa	10 21 03.3	+68 44 52	5.830	
pi 1	UMa	08 39 11.7	+65 01 15	5.640	
RW	Umi	16 47 54.8	+77 02 12	6.000	
AH	Vel	08 12 00.0	-46 38 40	5.500	4.2271710
HV	Vel	08 35 52.0	-50 58 11	5.770	2.6674500
IU	Vel	09 00 22.3	-43 10 26	5.970	
IV	Vel	09 57 10.9	-52 38 20	5.990	0.1608000
IW	Vel	10 57 07.8	-50 45 54	5.900	0.1500000
IZ	Vel	09 01 20.9	-41 51 51	5.530	
KL	Vel	09 12 30.5	-43 36 48	5.560	
LR	Vel	09 18 42.4	-51 33 38	5.820	
NN	Vel	08 09 09.5	-48 41 04	5.620	
OP	Vel	08 46 30.5	-45 54 45	5.500	
V0335	Vel	09 53 50.1	-51 08 48	5.880	
SS	Vir	12 25 14.0	+00 46 12	6.000	364.1400000
CS	Vir	14 18 38.5	-18 42 56	5.840	9.2954000
FW	Vir	12 38 22.7	+01 51 17	5.630	15.0000000
LN	Vir	13 14 31.3	+11 19 54	5.750	

## COSTANTI ASTRONOMICHE

0,0027379093110	Anni per giorno al 2000
0,0748042315774	Anni per orbita lunare al 2000
0,999961212611	Anni per rivoluzione al 2000
365,25	Anno giuliano
365,2425	Anno gregoriano
365,24219876	Anno tropico in giorni al 1900
365,24219264	Anno tropico in giorni al 2000
13,4225120288	Cicli nodali lunari per rivoluzione solare terrestre al 2000
346,620031	Ciclo eclittico lunare, in giorni, al 1900
346,620063	Ciclo eclittico lunare, in giorni, al 2000
6.700,52877977	Ciclo lunare da punto fisso, in giorni
6.798,36320013	Ciclo lunare da punto fisso, in gradi
6.816,97578004	Ciclo lunare da punto fisso, rotazioni
40.030.005,6967	Circonferenza media terrestre, in metri
40.075.003,5535	Circonferenza terrestre, equatoriale, in metri
10.001.965,72930	Circonferenza terrestre, in m,etri, quadrante meridiano, IUGG
0,518102946	Diametro angolare lunare, medio geocentrico, in gradi
12.756.280,0	Diametro terrestre equatoriale, in metri, IUGG, WGS84
149.597.870.000	Distanza del Sole, in metri (unità astronomiche)
356.375.000,0	Distanza della Luna al perigeo, in metri
406.720.000,0	Distanza della Luna all'apogeo, in metri
384.400.000,0	Distanza media della Luna, in metri
25.781,5756912	Durata in anni della precessione, al 2000
9.416.519,24934	Durata in giorni della precessione, al 2000
0,054900489	Eccentricità dell'orbita lunare
0,01671022	Eccentricità dell'orbita terrestre
365,25964438	Giorni per anno anomalistico al 2000
365,25964134	Giorni per anno anomalistico, 1900
29,5305888844	Giorni per periodo sinodico medio al 2000
27,32166156	Giorni per rivoluzione lunare al 2000
365,2563605	Giorni per rivoluzione media
365,25636053	Giorni per rivoluzione, al 2000
0,99726967199	Giorni per rotazione al 2000
36525	Giorni per secolo giuliano
57,2957795131	Gradi per radiante
5,1453964	Inclinazione dell'orbita lunare
0,996647189318820	Inverso dello schiacciamento terrestre
298,257222101	Inverso dello schiacciamento terrestre, IUGG
298,257223563	Inverso dello schiacciamento terrestre, WGS84
111.950,42769	Lunghezza di un ° di circonferenza terrestre in metri
18,6133019052	Ciclo dei nodi lunari, in anni
0,00511666	Nutazione dell'asse terrestre
23,439291111	Obliquità dell'eclittica
26,8206129544	Orbita per periodo lunare nodale, °
13,3687462502	Orbite lunari per orbita solare terrestre al 2000
1,00003878889	Orbite per anno al 2000
27,55454650	Periodo anomalistico lunare in giorni
27,2122207637	Periodo nodale lunare in giorni
0,0367481951835	Periodo nodale lunare per giorno al 2000
0,0366478605569	Periodo nodale lunare per rotazione al 2000
29,5305888844	Periodo sinodico lunare, medio, al 2000
3,87873887918E-05	Precessione annuale al 2000
0,0139634599651	Precessione annuale in gradi
3,82306869946E-05	Precessione giornaliera
3,87888933117E-05	Precessione per rivoluzione al 2000
6.378.140,0	Raggio equatoriale terrestre, in metri, IAU 1979
6.371.000,79	Raggio in metri di una sfera con la stessa superficie della Terra, IUGG
6.371.007,18	Raggio in metri di una sfera con lo stesso volume della Terra, IUGG

1.738.000,0	Raggio lunare in metri
6.371.008,77	Raggio terrestre medio, in metri, IUGG
6.356.755,28816	Raggio terrestre polare, in metri
27,32166156	Rivoluzione lunare in giorni al 2000
13,1403824445	Rivoluzioni lunari per rotazione, in gradi
18,6140238945	Rivoluzioni lunari per ciclo nodale (lunar major)
0,0366009950677	Rivoluzioni lunari per giorno al 2000
0,985609119791	Rivoluzioni lunari per giorno, in gradi
13,1763582244	Rivoluzioni lunari per giorno, media, in gradi
0,036501066623457	Rivoluzioni lunari per rotazione al 2000
0,982918083604	Rivoluzioni lunari per rotazione, in gradi
359,98603654	Rivoluzioni per anno in gradi
0,00273780311053	Rivoluzioni per giorno al 2000
0,0745017026513	Rivoluzioni per mese nodale al 2000
0,0748013300039	Rivoluzioni per orbita lunare al 2000
26,9284788014	Rivoluzioni per orbita lunare in gradi
27,1580123221	Rivoluzioni per periodo anomalistico lunare, in gradi
29,1056177173	Rivoluzioni per periodo lunare sinodico in gradi
0,00273032801001	Rivoluzioni per rotazione al 2000
29,6114378225	Rotazioni lunari per ciclo sinodico
366,2421544	Rotazioni per anno tropico al 2000
366,242154403	Rotazioni per anno, al 2000
347,569040486	Rotazioni per ciclo lunare eclittico
1,00273780311	Rotazioni per giorno al 2000
27,6299854231	Rotazioni per periodo anomalistico
27,2867224663	Rotazioni per periodo nodale al 2000
366,25636053	Rotazioni per rivoluzione al 2000
27,39646289	Rotazioni per rivoluzione lunare al 2000
0,00335281068118	Schiacciamento terrestre
8640	Secondi per giorno giuliano
6.378.137,0	Semiasse maggiore terrestre, in metri, WGS84
6.356.752,3141	Semiasse minore terrestre, in metri, WGS84

# SOLE - THE SUN

Classificazione	Sequenza principale
Classe spettrale	G2

PARAMETRI ORBITALI (epoca di riferimento: J2000)

Semiasse maggiore	26-28000 anni luce
Periodo orbitale	$2,25-2,50 \times 10^6$ anni
Velocità orbitale	217 km/s (media)
Sistema planetario	sì

## DATI FISICI

Diametro medio	1 392 000 km
Superficie	$6,09 \times 10^{18} \text{ m}^2$
Volume	$1,41 \times 10^{27} \text{ m}^3$
Massa	$1,9891 \times 10^{30} \text{ kg}$
Densità	$1,411 \times 10^3 \text{ kg/m}^3$
Acceleraz. di gravità in superficie	$274 \text{ m/s}^2$ (27,9 g)
Velocità di fuga	617,54 km/s
Periodo di rotazione	
All'equatore:	27 d 6 h 36 min
A 30° di latitudine:	28 d 4 h 48 min
A 60° di latitudine:	30 d 19 h 12 min
A 75° di latitudine:	31 d 19 h 12 min
Velocità di rotazione (all'equatore)	1993 m/s
Inclinaz. dell'asse sull'eclittica	7,25°
Inclinaz. dell'asse sul piano galattico	67,23°
A.R. polo nord	286,13° (19 h 4 min 30 s)
Declinazione	63,87° (63° 52')
Temperatura superficiale	5780 K (media)
T. della corona	$5 \times 10^6 \text{ K}$
T. del nucleo	$\sim 13,6 \times 10^6 \text{ K}$
Luminosità	$3,827 \times 10^{26} \text{ J/s}$
Radianza	$2,009 \times 10^7 \text{ W/(sr}\cdot\text{m}^2)$

## DATI OSSERVATIVI

Magnitudine apparente da Terra	-26,8 (media)
Magnitudine ass.	4,8

# PIANETI

	MERCURIO	VENERE	TERRA	LUNA	MARTE	GIOVE	SATURNO	URANO	NETTUNO
Massa (10 <sup>24</sup> kg)	0,33	4,87	5,97	0,073	0,642	1899	568	86,8	102
Diametro (km)	4879	12104	12756	3475	6794	142984	120536	51118	49528
Densità (kg/m3)	5427	5243	5515	3340	3933	1326	687	1270	1638
Gravità (m/s <sup>2</sup> )	3,7	8,9	9,8	1,6	3,7	23,1	9	8,7	11
Velocità di fuga (km/s)	4,3	10,4	11,2	2,4	5	59,5	35,5	21,3	23,5
Periodo di rotazione (ore)	1407,6	-5832,5	23,9	655,7	24,6	9,9	10,7	-17,2	16,1
Lunghezza del giorno (ore)	4222,6	2802	24	708,7	24,7	9,9	10,7	17,2	16,1
Distanza dal Sole (10 <sup>6</sup> km)	57,9	108,2	149,6	0,384*	227,9	778,6	1433,5	2872,5	4495,1
Perielio (10 <sup>6</sup> km)	46	107,5	147,1	0,363*	206,6	740,5	1352,6	2741,3	4444,5
Afelio (10 <sup>6</sup> km)	69,8	108,9	152,1	0,406*	249,2	816,6	1514,5	3003,6	4545,7
Periodo orbitale (giorni)	88	224,7	365,2	27,3	687	4331	10756	30706	60223
Velocità orbitale (km/s)	47,9	35	29,8	1	24,1	13,1	9,7	6,8	5,4
Inclinazione orbitale (gradi)	7	3,4	0	5,1	1,9	1,3	2,5	0,8	1,8
Eccentricità orbitale	0,205	0,007	0,017	0,055	0,094	0,049	0,057	0,046	0,011
Inclinazione dell'asse (gradi)	0,01	177,4	23,5	6,7	25,2	3,1	26,7	97,8	28,3
Temperatura media (C)	167	464	15	-20	-65	-110	-140	-195	-200
Pressione sulla superficie (bar)	0	92	1	0	0,01	Sconosciuta	Sconosciuta	Sconosciuta	Sconosciuta
Satelliti	0	0	1	0	2	63	60	27	13
Anelli	No	No	No	No	No	Yes	Yes	Yes	Yes
Campo magnetico	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes

\* valori riferiti alla Terra

	Sole	Mercurio	Venere	Terra	Luna	Marte	Giove	Saturno	Urano	Nettuno
Sole	-	4960,5	2654,8	1920,2	1920,2	1260,5	369,0	200,4	100,0	63,9
Mercurio	17,4	-	20,0	11,0	11,0	5,9	1,4	0,7	0,4	0,2
Venere	23,1	49,7	-	60,3	60,3	20,9	3,7	1,9	0,9	0,6
Terra	17,6	28,7	63,6	-	-	33,6	4,2	2,1	1,0	0,6
Luna	4,8	7,8	17,3	-	-	9,2	1,1	0,6	0,3	0,2
Marte	6,2	8,2	11,7	17,9	17,9	-	2,5	1,2	0,5	0,3
Giove	37,9	40,9	44,0	46,9	46,9	53,6	-	45,1	14,1	7,9
Saturno	17,4	18,1	18,8	19,4	19,4	20,6	38,0	-	17,3	8,1
Urano	3,7	3,7	3,8	3,9	3,9	4,0	5,0	7,3	-	6,5
Nettuno	2,3	2,3	2,3	2,4	2,4	2,4	2,8	3,3	6,3	-

Diametri medi in " che i pianeti sottendono visti da un corpo all'altro

# PLANETS

	MERCURY	VENUS	EARTH	MOON	MARS	JUPITER	SATURN	URANUS	NEPTUNE
Weight ( $10^{24}$ kg)	0,33	4,87	5,97	0,073	0,642	1899	568	86,8	102
Diameter (km)	4879	12104	12756	3475	6794	142984	120536	51118	49528
Density (kg/m <sup>3</sup> )	5427	5243	5515	3340	3933	1326	687	1270	1638
Gravity (m/s <sup>2</sup> )	3,7	8,9	9,8	1,6	3,7	23,1	9	8,7	11
Velocità of escape (km/s)	4,3	10,4	11,2	2,4	5	59,5	35,5	21,3	23,5
Period of rotation (hours)	1407,6	-5832,5	23,9	655,7	24,6	9,9	10,7	-17,2	16,1
Length of the day (hours)	4222,6	2802	24	708,7	24,7	9,9	10,7	17,2	16,1
distance from the Sun ( $10^6$ km)	57,9	108,2	149,6	0,384*	227,9	778,6	1433,5	2872,5	4495,1
Perihelion ( $10^6$ km)	46	107,5	147,1	0,363*	206,6	740,5	1352,6	2741,3	4444,5
Aphelion ( $10^6$ km)	69,8	108,9	152,1	0,406*	249,2	816,6	1514,5	3003,6	4545,7
Orbital period (days)	88	224,7	365,2	27,3	687	4331	10,747	30,589	59,8
Orbital velocity (km/s)	47,9	35	29,8	1	24,1	13,1	9,7	6,8	5,4
Orbital inclination (degrees)	7	3,4	0	5,1	1,9	1,3	2,5	0,8	1,8
Eccentricity	0,205	0,007	0,017	0,055	0,094	0,049	0,057	0,046	0,011
Inclination (gradi)	0,01	177,4	23,5	6,7	25,2	3,1	26,7	97,8	28,3
Temperatur (C)	167	464	15	-20	-65	-110	-140	-195	-200
Pressure (bar)	0	92	1	0	0,01	Sconosciuta	Sconosciuta	Sconosciuta	Sconosciuta
Satellites	0	0	1	0	2	63	60	27	13
Rings	No	No	No	No	No	Yes	Yes	Yes	Yes
Magnetic field	Yes	No	Yes	No	No	Yes	Yes	Yes	Yes

\* data referred to the Earth

## SATELLITI DI MARTE - SATELLITES OF MARS

Nome		Diametro medio	Massa	Raggio orbitale medio	Periodo orbitale	Scoperta
Name		Diameter	Weight	Orbital radius	Orbital period	Discovery
Marte I	Fobos	27,0x21,6x18,8 km	10,8x1015 kg	9 377 km	7,66 ore	1877
Marte II	Deimos	10x12x16 km	2x1015 kg	23 460 km	30,35 ore	1877

## SATELLITI DI GIOVE - SATELLITES OF JUPITER

Nome		Diametro medio	Massa	Raggio Orbitale Medio	Periodo orbitale	Scoperta	Gruppo
Name		Diameter	Weight	Orbital radius	Orbital period	Discovery	Group
Giove XVI	Metide	43 km	120x1015 kg	127 690 km	0,294780 giorni	1979	Gruppo di Amaltea
Giove XV	Adrastea	26x20x16 km	7,5x1015 kg	128 694 km	0,29826 giorni	1979	Gruppo di Amaltea
Giove V	Amaltea	262x146x134 km	2,1x1018 kg	181 170 km	0,498179 giorni	1892	Gruppo di Amaltea
Giove XIV	Tebe	110x90 km	1,5x1018 kg	221 700 km	0,6745 giorni	1979	Gruppo di Amaltea
Giove I	Io	3 643 km	89x1021 kg	421 700 km	1,769138 giorni	1610	Satelliti galileiani
Giove II	Europa	3 122 km	48x1021 kg	671 034 km	3,551181 giorni	1610	Satelliti galileiani
Giove III	Ganimede	5 262 km	150x1021 kg	1 070 412 km	7,154553 giorni	1610	Satelliti galileiani
Giove IV	Callisto	4 821 km	110x1021 kg	1 882 709 km	16,689018 giorni	1610	Satelliti galileiani
Giove XVIII	Temisto	8 km	0,69x1015 kg	7 391 645 km	129,8276 giorni	1975	
Giove XIII	Leda	20 km	11x1015 kg	11 097 245 km	238,8242 giorni	1974	Gruppo di Imalia
Giove VI	Imalia	170 km	6,7x1018 kg	11 432 435 km	249,7263 giorni	1904	Gruppo di Imalia
Giove X	Lisitea	36 km	63x1015 kg	11 653 225 km	256,9954 giorni	1938	Gruppo di Imalia
Giove VII	Elara	86 km	870x1015 kg	11 683 115 km	257,9849 giorni	1905	Gruppo di Imalia
S/2000 J 11		4 km	90x1012 kg	12 570 575 km	287,9310 giorni	2000	Gruppo di Imalia
Giove XLVI	Carpo	3 km	45x1012 kg	17 144 875 km	1,2556 anni	2003	
S/2003 J 12		1 km	1,5x1012 kg	17 739 540 km	1,3215 anni	2000	
Giove XXXIV	Euporia	2 km	15x1012 kg	19 088 435 km	1,4751 anni	2001	Gruppo di Ananke?
S/2003 J 3		2 km	15x1012 kg	19 621 780 km	1,5374 anni	2003	Gruppo di Ananke
S/2003 J 18		2 km	15x1012 kg	19 812 575 km	1,5598 anni	2003	Gruppo di Ananke
Giove XLII	Telsinoe	2 km	15x1012 kg	20 453 755 km	1,6362 anni	2003	Gruppo di Ananke
Giove XXXIII	Euante	3 km	45x1012 kg	20 464 855 km	1,6375 anni	2001	Gruppo di Ananke
Giove XLV	Elice	4 km	90x1012 kg	20 540 265 km	1,6465 anni	2003	Gruppo di Ananke?
Giove XXXV	Ortosia	2 km	15x1012 kg	20 567 970 km	1,6499 anni	2001	Gruppo di Ananke?
Giove XXIV	Iocaste	5 km	190x1012 kg	20 722 565 km	1,6685 anni	2000	Gruppo di Ananke
S/2003 J 16		2 km	15x1012 kg	20 743 780 km	1,6711 anni	2003	Gruppo di Ananke
Giove XII	Ananke	28 km	30x1015 kg	20 815 225 km	1,6797 anni	1951	Gruppo di Ananke
Giove XXVII	Praxidike	7 km	430x1012 kg	20 823 950 km	1,6808 anni	2000	Gruppo di Ananke
Giove XXII	Arpalice	4 km	120x1012 kg	21 063 815 km	1,7099 anni	2000	Gruppo di Ananke
Giove XXX	Ermippe	4 km	90x1012 kg	21 182 085 km	1,7243 anni	2001	Gruppo di Ananke?
Giove XXIX	Tione	4 km	90x1012 kg	21 405 570 km	1,7517 anni	2001	Gruppo di Ananke
Giove XL	Mneme	2 km	15x1012 kg	21 427 110 km	1,7543 anni	2003	Gruppo di Ananke
S/2003 J 17		2 km	15x1012 kg	22 134 305 km	1,8419 anni	2003	Gruppo di Carme
Giove XXXI	Aitne	3 km	45x1012 kg	22 285 160 km	1,8608 anni	2001	Gruppo di Carme
Giove XXXVII	Cale	2 km	15x1012 kg	22 409 210 km	1,8763 anni	2001	Gruppo di Carme
Giove XX	Taigete	5 km	160x1012 kg	22 438 650 km	1,8800 anni	2000	Gruppo di Carme
S/2003 J 19		2 km	15x1012 kg	22 709 060 km	1,9141 anni	2003	Gruppo di Carme
Giove XXI	Caldene	4 km	75x1012 kg	22 713 445 km	1,9147 anni	2000	Gruppo di Carme
S/2003 J 15		2 km	15x1012 kg	22 721 000 km	1,9156 anni	2003	Gruppo di Ananke?
S/2003 J 10		2 km	15x1012 kg	22 730 815 km	1,9168 anni	2003	Gruppo di Carme?
S/2003 J 23		2 km	15x1012 kg	22 739 655 km	1,9180 anni	2003	Gruppo di Pasife
Giove XXV	Erinome	3 km	45x1012 kg	22 986 265 km	1,9493 anni	2000	Gruppo di Carme
Giove XLI	Aede	4 km	90x1012 kg	23 044 175 km	1,9566 anni	2003	Gruppo di Pasife
Giove XLIV	Callicore	2 km	15x1012 kg	23 111 825 km	1,9652 anni	2003	Gruppo di Carme?
Giove XXIII	Calice	5 km	190x1012 kg	23 180 775 km	1,9740 anni	2000	Gruppo di Carme
Giove XXXII	Euridome	3 km	45x1012 kg	23 230 860 km	1,9804 anni	2001	Gruppo di Pasife?
S/2003 J 14		2 km	15x1012 kg	23 238 595 km	1,9814 anni	2003	Gruppo di Pasife
Giove XXXVIII	Pasitee	2 km	15x1012 kg	23 307 320 km	1,9902 anni	2001	Gruppo di Carme
Giove XLVIII	Cillene	2 km	15x1012 kg	23 396 270 km	2,0016 anni	2003	Gruppo di Pasife
Giove XLVII	Eukelade	4 km	90x1012 kg	23 483 695 km	2,0129 anni	2003	Gruppo di Carme
S/2003 J 4		2 km	15x1012 kg	23 570 790 km	2,0241 anni	2003	Gruppo di Pasife
Giove XXXIX	Egemone	3 km	45x1012 kg	23 702 510 km	2,0411 anni	2003	Gruppo di Pasife
Giove XLIII	Arche	3 km	45x1012 kg	23 717 050 km	2,0429 anni	2002	Gruppo di Carme
Giove XI	Carme	46 km	0,13x1018 kg	23 734 465 km	2,0452 anni	1938	Gruppo di Carme
Giove XXVI	Isonoe	4 km	75x1012 kg	23 832 630 km	2,0579 anni	2000	Gruppo di Carme
S/2003 J 9		1 km	1,5x1012 kg	23 857 810 km	2,0612 anni	2003	Gruppo di Carme
S/2003 J 5		4 km	90x1012 kg	23 973 925 km	2,0762 anni	2003	Gruppo di Carme
Giove VIII	Pasife	60 km	300x1015 kg	24 094 770 km	2,0919 anni	1908	Gruppo di Pasife
Giove IX	Sinope	38 km	75x1015 kg	24 214 390 km	2,1075 anni	1908	Gruppo di Pasife
Giove XXXVI	Sponde	2 km	15x1012 kg	24 252 625 km	2,1125 anni	2001	Gruppo di Pasife
Giove XXVIII	Autonoe	4 km	90x1012 kg	24 264 445 km	2,1141 anni	2001	Gruppo di Pasife
Giove XVII	Calliroe	9 km	870x1012 kg	24 356 030 km	2,1261 anni	1999	Gruppo di Pasife
Giove XIX	Megaclite	5 km	210x1012 kg	24 687 240 km	2,1696 anni	2000	Gruppo di Pasife
S/2003 J 2		2 km	15x1012 kg	30 290 845 km	2,9487 anni	2003	



# SATELLITI DI SATURNO - SATELLITES OF SATURN

Nome		Diametro medio	Massa	Raggio Orbitale medio	Periodo orbitale	Scoperta	Gruppo
Name		Diameter	Weight	Orbital radius	Orbital period	Discovery	Group
Saturno XVIII	Pan	35x35x23 km	2,7x1015 kg	133 583 km	0,575 giorni	1990	
Saturno XXXV	Dafni	7 km	?	136 505 km	0,59537 giorni	2005	
Saturno XV	Atlante	40x20 km	?	137 670 km	0,6019 giorni	1980	
Saturno XVI	Prometeo	145x85x62 km	0,270x1018 kg	139 350 km	0,6130 giorni	1980	
Saturno XVII	Pandora	114x84x62 km	0,220x1018 kg	141 700 km	0,6285 giorni	1980	
Saturno XI	Epimeteo	144x108x98 km	0,560x1018 kg	151 422 km	0,6942 giorni	1980	
Saturno X	Giano	196x192x150 km	2,01x1018 kg	151 472 km	0,6945 giorni	1966	
Saturno I	Mimante	397 km	38,0x1018 kg	185 520 km	0,942422 giorni	1789	
Saturno XXXII	Metone	3 km	?	194 000 km	1,01 giorni	2004	
Saturno XLIX	Antea	2 km	?	197 700 km	1,04 giorni	2007	
Saturno XXXIII	Pallene	4 km	?	211 000 km	1,14 giorni	2004	
Saturno II	Encelado	499 km	73,0x1018 kg	238 020 km	1,370218 giorni	1789	
Saturno XIII	Telesto	34x28x36 km	?	294 660 km	1,887802 giorni	1980	
Saturno III	Teti	1 060 km	0,622x1021 kg	294 660 km	1,887802 giorni	1684	
Saturno XIV	Calipso	34x22x22 km	?	294 660 km	1,887802 giorni	1980	
Saturno XII	Elena	36x32x30 kg	?	377 400 km	2,736915 giorni	1980	
Saturno IV	Dione	1 118 km	1,05x1021 kg	377 400 km	2,736915 giorni	1684	
Saturno XXXIV	Polluce	13 km	?	377 400 km	2,736915 giorni	2004	
Saturno V	Rea	1 528 km	2,49x1021 kg	527 040 km	4,5175 giorni	1672	
Saturno VI	Titano	5 151 km	135x1021 kg	1 221 850 km	15,94542 giorni	1655	
Saturno VII	Iperione	410x260x220 km	17,7x1018 kg	1 481 100 km	21,27661 giorni	1848	
Saturno VIII	Giapeto	1 460 km	1,88x1021 kg	3 561 300 km	79,33018 giorni	1671	
Saturno XXIV	Kiviuq	16 km	3,3x1015 kg	11 365 000 km	1,2298 anni	2000	Gruppo Inuit
Saturno XXII	Ijiraq	12 km	?	11 442 000 km	1,2361 anni	2000	Gruppo Inuit
Saturno IX	Febe	220 km	4,00x1018 kg	12 944 300 km	-1,5009 anni	1899	Gruppo Nordico
Saturno XX	Paaliaq	22 km	?	15 199 000 km	1,8806 anni	2000	Gruppo Inuit
Saturno XXVII	Skadi	8 km	?	15 647 000 km	-1,9956 anni	2000	Gruppo Nordico
Saturno XXVI	Albiorix	32 km	?	16 404 000 km	2,1451 anni	2000	Gruppo Gallico
S/2007 S 2		6		16 560 000 km	-2,171 anni	2007	Gruppo Nordico
Saturno XXXVII	Bebhionn	6 km	?	16 950 000 km	2,25 anni	2004	Gruppo Inuit
Saturno XLVII	Skoll	6 km		17 610 000 km	-2,3792 anni	2006	
Saturno XXVIII	Erriapo	10 km	?	17 616 000 km	2,3871 anni	2000	Gruppo Gallico
S/2007 S 1		7 km	?	17 910 600 km	-2,44 anni	2007	Gruppo Inuit
S/2006 S 4		6 km		18 105 000 km	-2,4778 anni	2006	
Saturno XXIX	Siarnaq	40 km	?	18 160 000 km	2,4452 anni	2000	Gruppo Inuit
Saturno XLIV	Hyrrokkin	8 km		18 217 125 km	-2,4970 anni	2004	
Saturno XXI	Tarvos	15 km	?	18 247 000 km	2,5342 anni	2000	Gruppo Gallico
S/2004 S 13		6 km	?	18 450 000 km	-2,48 anni	2004	Gruppo Nordico
S/2006 S 6		6 km		18 600 000 km	-2,5791 anni	2006	
S/2004 S 17		4 km	?	18 600 000 km	-2,70 anni	2004	Gruppo Nordico
Saturno XXV	Mundilfari	7 km	?	18 722 000 km	-2,6048 anni	2000	Gruppo Nordico
Saturno XXXVIII	Bergelmir	6 km	?	18 750 000 km	-2,76 anni	2004	Gruppo Nordico
S/2006 S 1		6 km		18 981 135 km	-2,6558 anni	2006	
Saturno XXXVI	Ægir	6 km	?	19 350 000 km	-2,81 anni	2004	Gruppo Nordico
Saturno XXXI	Narvi	7 km	?	19 370 700 km	-2,7558 anni	2003	Gruppo Nordico
S/2004 S 12		5 km	?	19 650 000 km	-2,87 anni	2004	Gruppo Nordico
Saturno XXXIX	Bestla	7 km	?	19 650 000 km	-2,88 anni	2004	Gruppo Nordico
Saturno XXIII	Suttungr	7 km	?	19 666 700 km	-2,8192 anni	2000	Gruppo Nordico
Saturno XL	Farbauti	5 km	?	19 800 800 km	-2,95 anni	2004	Gruppo Nordico
S/2004 S 7		6 km	?	19 800 000 km	-3,02 anni	2004	Gruppo Nordico
Saturno XLIII	Hati	6 km	?	19 950 000 km	-2,96 anni	2004	Gruppo Nordico
S/2007 S 3		5 km		20 518 500 km	-3,01 anni	2007	
Saturno XXX	Thrymr	7 km	?	20 810 300 km	-3,07 anni	2000	Gruppo Nordico
S/2006 S 3		6 km		21 132 000 km	-3,13 anni	2006	

## SATELLITI DI URANO - SATELLITES OF URANUS

Nome		Diametro medio	Massa	Raggio orbitale medio	Periodo orbitale	Scoperta
Name		Diameter	Weight	Orbital radius	Orbital period	Discovery
Urano VI	Cordelia	13 ± 2 km	0,8×1018 kg	49 752 km	0,3350338 giorni	1986
Urano VII	Ofelia	15 ± 8 km	0,8×1018 kg	53 764	0,376400 giorni	1986
Urano VIII	Bianca	21 ± 4 km	0,8×1018 kg	59 166	0,43457899 giorni	1986
Urano IX	Cressida	80 ± 4 km	0,343×1018 kg	61 780 km	0,463570 giorni	1986
Urano X	Desdemona	64 ± 8 km	0,178×1018 kg	62 680 km	0,473650 giorni	1986
Urano XI	Juliet	94 ± 8 km	0,557×1018 kg	64 350 km	0,493065 giorni	1986
Urano XII	Porzia	135 ± 8 km	1,68×1018 kg	66 090 km	0,513196 giorni	1986
Urano XIII	Rosalind	72 ± 12 km	0,254×1018 kg	69 940 km	0,558460 giorni	1986
Urano XXVII	Cupido	~17,8 km	3,8×1015 kg	74 800 km	0,618 giorni	2003
Urano XIV	Belinda	81 ± 16 km	0,357×1018 kg	75 260 km	0,623527 giorni	1986
Urano XXV	Perdita	~26,6 km	13×1015 kg	76 420 km	0,638 giorni	1986
Urano XV	Puck	162 ± 4 km	2,89 × 1018 kg	86 010 km	0,761833 giorni	1986
Urano XXVI	Mab	~24,8 km	1,0 × 1016 kg	97 734 km	0,923 giorni	2003
Urano V	Miranda	471,6 ± 1,4 km	(66 ± 7) × 1018 kg	129 390 km	1,413479 giorni	1948
Urano I	Ariel	1157,8 ± 1,2 km	(1,35 ± 0,12) × 1021 kg	191 020 km	2,520379 giorni	1851
Urano II	Umbriel	1169,4 ± 5,6 km	(1,17 ± 0,13) × 1021 kg	266 300 km	4,144177 giorni	1851
Urano III	Titania	1577,8 ± 3,6 km	(3,53 ± 0,09) × 1021 kg	435 910 km	8,705872 giorni	1787
Urano IV	Oberon	1522,8 ± 5,2 km	(3,01 ± 0,07) × 1021 kg	583 520 km	13,463239 giorni	1787
Urano XXII	Francisco	~12 km	1,3×1015 kg	4 276 000 km	-0,7299 anni	2001
Urano XVI	Calibano	~98 km	0,73×1018 kg	7 231 000 km	-1,5871 anni	1997
Urano XX	Stefano	~20 km	6×1015 kg	8 004 000 km	-1,8546 anni	1999
Urano XXI	Trinculo	~10 km	0,75×1015 kg	8 504 000 km	-2,0780 anni	2001
Urano XVII	Sicorace	~190 km	5,4×1018 kg	12 179 000 km	-3,5272 anni	1997
Urano XXIII	Margherita	~11 km	1,3×1015 kg	14 345 000 km	4,6401 anni	2003
Urano XVIII	Prospero	~30 km	21×1015 kg	16 256 000 km	-5,4136 anni	1999
Urano XIX	Setebos	~30 km	21×1015 kg	17 418 000 km	-6,1185 anni	1999
Urano XXIV	Ferdinando	~12 km	1,3×1015 kg	20 901 000 km	-7,7300 anni	2001

## SATELLITI DI NETTUNO - SATELLITES OF NEPTUNE

Nome		Diametro medio	Massa	Raggio orbitale medio	Periodo orbitale	Scoperta
Name		Diameter	Weight	Orbital radius	Orbital period	Discovery
Nettuno III	Naiade	58 km	~0,19×1018 kg	48 227 km	0,294 giorni	1989
Nettuno IV	Talassa	80 km	~0,37×1018 kg	50 075 km	0,311 giorni	1989
Nettuno V	Despina	148 km	~2,10×1018 kg	52 526 km	0,335 giorni	1989
Nettuno VI	Galatea	158 km	~3,70×1018 kg	61 593 km	0,429 giorni	1989
Nettuno VII	Larissa	208×178 km	~4,90×1018 kg	73 548 km	0,555 giorni	1981
Nettuno VIII	Proteo	436×416×402 km	~50×1018 kg	117 647 km	1,122 giorni	1989
Nettuno I	Tritone	2700 km	21,4×1021 kg	354 800 km	-5,877 giorni	1846
Nettuno II	Nereide	340 km	~31×1018 kg	5 513 400 km	0,99 anni	1949
Nettuno IX	Alimede	60 km	~0,09×1018 kg	15 728 000 km	-5,15 anni	2002
Nettuno XI	Sao	38 km	~0,09×1018 kg	22 422 000 km	7,98 anni	2002
Nettuno XII	Laomedea	38 km	~0,09×1018 kg	23 571 000 km	8,67 anni	2002
Nettuno X	Psamate	28 km	~0,015×1018 kg	46 695 000 km	-24,96 anni	2003
Nettuno XIII	Neso	60 km	~0,09×1018 kg	48 387 000 km	-25,67 anni	2002

# EVENTI EXTRATERRESTRI

Nelle tabelle seguenti sono calcolati i transiti e le eclissi che potrebbe osservare un ipotetico essere vivente o sonda presente sul pianeta indicato.

## EXTRATERRESTRIAL EVENTS

In the following charts they are calculated the transits and the eclipses that could observe a hypothetical living being or probe present on the suitable planet.

Mercurio - Mercury

Questo anno non avvengono fenomeni - No phenomena this year

Venere - Venus

Questo anno non avvengono fenomeni - No phenomena this year

Marte - Mars

Questo anno non avvengono fenomeni - No phenomena this year

Giove - Jupiter

Questo anno non avvengono fenomeni - No phenomena this year

Saturno - Saturn

Questo anno non avvengono fenomeni - No phenomena this year

Urano - Uranus

Questo anno non avvengono fenomeni - No phenomena this year

Nettuno - Neptune

Questo anno non avvengono fenomeni - No phenomena this year

Luna - Moon

Date	TT	Dm	Dl	r1	r2	e	m1	m2	tm(s)		
2010/06/26	11:39:33	0.65410	1.43757	1.019	0.003	0	-26.8	-4.1	15821	Sun	Earth
2010/06/26	05:42:49	0.01884	1.17930	1.321	0.003	-3	-1.9	-7.3	15420	Mercury	Earth
2010/08/26	02:04:44	0.15878	1.14517	0.650	0.003	16	1.2	-10.9	12545	Mercury	Earth
2010/11/23	05:28:08	0.50522	1.21511	0.003	2.361	18	-11.4	1.2	11933	Earth	Mars
2010/12/21	08:18:03	0.31113	1.50442	0.986	0.003	0	-26.9	-2.6	16474	Sun	Earth

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi

R1 = distanza in U.A. del primo corpo

R2 = distanza in U.A. del secondo corpo

e = elongazione, in gradi

m1 = magnitudine del primo corpo

m2 = magnitudine del secondo corpo

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno

Moon=Luna

Esempio di lettura :

Luna. Il giorno 26 giugno la Terra occulterà Mercurio se visto dalla nostra Luna.

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if  $Dm < Dl$  there is an occultation of the planet

R1 = distance in A.U. of the first body

R2 = distance in A.U. of the second body

e = elongation, in °

m1 = magnitude of the first body

m2 = magnitude of the second body

tm = if present, the planet is occulted maximum for x seconds

# EVENTI EXTRATERRESTRI

Nelle tabelle seguenti sono calcolati i fenomeni Terra-Luna che potrebbe osservare un ipotetico essere vivente o sonda presente sul pianeta indicato.

## EXTRATERRESTRIAL EVENTS

In the following charts they are calculated the phenomena Earth-Moon that could observe a hypothetical living being or probe present on the suitable planet.

Mercurio - Mercury

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)		
2010/06/26 05:58:20		0.00003	0.00236	1.318	1.321	172	10	-2.9	0.9	19598	Earth	Moon
2010/08/26 02:09:41		0.00066	0.00480	0.647	0.650	335	-140	-4.3	-0.5	15921	Earth	Moon

Venere - Venus

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)		
2010/05/16 10:31:03		0.00015	0.00226	1.380	1.378	356	-45	-2.4	1.4	16814	Earth	Moon
2010/09/11 13:01:24		0.00154	0.00613	0.510	0.507	162	-107	-4.3	-0.5	15418	Earth	Moon
2010/11/05 08:27:14		0.00145	0.01129	0.278	0.275	161	163	-6.2	-2.5	14351	Earth	Moon

Marte - Mars

Date	TT	Dm	Dl	r1	r2	p	e	m1	m2	tm(s)		
2010/11/23 05:50:07		0.00055	0.00132	2.359	2.361	1	-12	-1.5	2.3	15183	Earth	Moon
2010/12/06 22:03:19		0.00057	0.00131	2.370	2.367	5	-10	-1.6	2.2	15067	Earth	Moon

Giove - Jupiter

Questo anno non avvengono fenomeni - No phenomena this year

Saturno - Saturn

Questo anno non avvengono fenomeni - No phenomena this year

Urano - Uranus

Questo anno non avvengono fenomeni - No phenomena this year

Nettuno - Neptune

Questo anno non avvengono fenomeni - No phenomena this year

Esempio di lettura :

Il giorno 26 giugno la Terra occulterà la Luna se vista da Mercurio.

Data nel formato anno/mese/giorno

Dm = distanza minima in gradi tra i centri dei corpi

Dl = parametro limite, se  $Dm < Dl$  vi è una occultazione tra i corpi

R1 = distanza in U.A. del primo corpo

R2 = distanza in U.A. del secondo corpo

e = elongazione, in gradi

m1 = magnitudine del primo corpo

m2 = magnitudine del secondo corpo

tm = se presente, uno dei due corpi viene occultato massimo per x secondi

Mercury=Mercurio Venus=Venere Mars=Marte Jupiter=Giove Saturn=Saturno Uranus=Urano Neptune=Nettuno  
Moon=Luna

Date in the format year/month/day

Dm = least distance between the centers of the bodies

Dl = parameter limit, if  $Dm < Dl$  there is an occultation of the planet

R1 = distance in A.U. of the first body

R2 = distance in A.U. of the second body

e = elongation, in °

m1 = magnitude of the first body

m2 = magnitude of the second body

tm = if present, the planet is occulted maximum for x seconds

# GLOSSARIO ASTRONOMICO

**Aberrazione** - Deviazione della direzione dei raggi luminosi provenienti da un corpo celeste.

**Aberrazione annua** - Spostamento angolare apparente delle stelle rispetto alla volta celeste, dovuto al moto di rivoluzione della Terra attorno al Sole.

**Aberrazione astronomica** (o aberrazione della luce) - Variazione apparente della posizione di un astro dovuta al movimento della Terra e alla velocità finita della luce. L'aberrazione annua, scoperta da Bradley nel 1727, dipende dal moto di rivoluzione, quella diurna dal moto di rotazione.

**Aberrazione diurna** - Spostamento angolare apparente delle stelle rispetto alla volta celeste, dovuto al moto di rotazione della Terra attorno al proprio asse.

**Absidi** - Punti estremi dell'asse maggiore di un'orbita ellittica. La retta che li congiunge si dice linea degli absidi.

**Afelio** - Punto dell'orbita di un corpo del sistema solare di massima distanza dal Sole.

**Albedo** - Rapporto fra la luce incidente e fra quella riflessa dalla superficie di ogni corpo celeste.

**Alumcàntarat** - Circolo sulla sfera celeste parallelo all'orizzonte, che unisce i punti con la stessa altezza.

**Altazimutali, coordinate** - Sistema di coordinate celesti relative all'orizzonte terrestre ed alla verticale del luogo, le cui componenti sono l'azimut e l'altezza.

**Altezza** - Distanza angolare di un oggetto celeste dall'orizzonte. E' tracciata sul cerchio verticale passante per lo zenit, il nadir e per l'astro in osservazione e si misura da 0 e 90 gradi, partendo dall'orizzonte, positivamente sopra di esso e negativamente al contrario.

**Ammasso** - Insieme di stelle o di galassie che si raggruppano per via delle forze gravitazionali reciproche.

**Ammasso aperto** - Ammasso stellare situato nel disco della Galassia e contenente migliaia di stelle giovani e molto luminose.

**Ammasso di Galassie** - Gruppo di galassie legate dall'attrazione gravitazionale. La nostra Galassia appartiene al cosiddetto Gruppo Locale.

**Ammasso globulare (cluster)** - Ammasso sferico situato nell'alone della Galassia e contenente centinaia di migliaia di stelle molto vecchie e ravvicinate.

**Ammasso stellare** - Gruppo di stelle tenute insieme dalle interazioni gravitazionali. Può essere aperto, qualora abbia una forma irregolare, o globulare se è caratterizzato da una forma sferica.

**Anello** - Insieme di detriti e particelle che disponendosi sul piano equatoriale caratterizza i pianeti gioviani. Può avere diverse dimensioni:maestose, come in Saturno, od impercettibili all'osservazione telescopica come in Giove, Urano e Nettuno.

**Angolo orario** - Distanza angolare di un corpo celeste dal meridiano del luogo.

**Anno** - Periodo di tempo corrispondente alla durata di una intera rivoluzione della Terra attorno al Sole.

**Anno anomalistico** - Periodo di tempo compreso fra due successivi passaggi della Terra al perielio.

**Anno astronomico** - Periodo definito da due passaggi consecutivi della Terra per lo stesso punto della sua orbita.

**Anno bisestile** - Anno di 366 giorni introdotto per recuperare la differenza di 0,25 giorni (6 ore) fra l'anno civile e l'anno solare. Comporta l'aggiunta, all'anno civile, di un giorno ogni 4 anni.

**Anno civile** - Periodo di tempo usato in ambito civile, che basandosi sull'anno solare tiene conto solo della parte intera di tale valore (365 giorni).

**Anno draconico** - Periodo orbitale misurato tra due passaggi della Terra al nodo lunare ascendente (346g 14h 53m).

**Anno luce** - Unità di misura delle distanze interstellari corrispondente alla distanza coperta dalla luce in un anno, alla velocità propria di 300000 km al secondo. Ammonta a circa 9.460 miliardi di km o 63 U.A.

**Anno siderale** - Intervallo di tempo fra due successivi allineamenti di una stella con la Terra. Corrisponde ad una completa rivoluzione del nostro pianeta attorno al Sole. Dura 365 giorni, 6 ore, 9 minuti.

**Anno solare o tropico** - Intervallo di tempo fra due successivi passaggi del Sole all'equinozio di primavera. E' piu' corto di quello siderale per effetto della precessione degli equinozi, ammonta infatti a circa 365 giorni, 5 ore, 48 minuti.

**Anomalia** - Distanza angolare, calcolata per un dato istante, fra la posizione di un pianeta ed il perielio della sua orbita. Può essere media, se si tiene conto della velocità orbitale media, o vera, nel caso si consideri quella effettiva.

**Apastro** - Punto dell'orbita ellittica di una stella binaria di maggior distanza dal fuoco.

**Apogeo** - Punto dell'orbita lunare, o di un satellite artificiale, di maggior distanza dalla Terra.

**Apsidi** - I due punti di intersezione tra l'orbita ellittica percorsa da un corpo e il suo asse maggiore (detto linea degli apsi). Nel caso di un'orbita intorno al Sole i punti sono detti afelio e perielio.

**Arco diurno** - Traiettoria descritta nel cielo da ogni corpo celeste, fra l'istante di levata e quello del tramonto.

**Argomento del perielio** - Angolo compreso fra il nodo ascendente ed il perielio, misurato in direzione del senso di rivoluzione del corpo celeste attorno al Sole.

**Ascensione retta** - Componente delle coordinate equatoriali che rappresenta la distanza angolare fra il punto di Ariete e l'intersezione del cerchio orario passante per l'astro in osservazione con l'equatore celeste. Si misura in ore, a partire dal punto d'ariete, in senso antiorario (verso Est), ed è compresa fra 0 e 24.

**Asse** - Retta ideale attorno alla quale ruotano su se stessi i corpi celesti. Quello della Terra, passante per i poli Nord e Sud è detto asse terrestre.

**Asse celeste** - Prolungamento dell'asse terrestre attorno al quale, per effetto della rotazione della Terra, ruota apparentemente la sfera celeste.

**Asse maggiore** - Diametro massimo di un'orbita ellittica.

**Asse polare** - Asse puntato parallelamente all'asse terrestre intorno al quale ruota un telescopio equatoriale per variare solamente l'ascensione retta.

**Associazione stellare** - Raggruppamento di giovani stelle avente origine comune.

**Asterismo** - Struttura di stelle che non costituisce una costellazione, ma che è conosciuta con un nome (per esempio il Grande Carro).

**Asteroidi** - Corpi del sistema solare dalle piccole dimensioni che ruotano attorno al Sole con orbite ellittiche. Detti anche pianetini occupano principalmente una posizione fra l'orbita di Marte e Giove chiamata fascia degli asteroidi.

**Astro** - Corpo celeste generico (stella, pianeta, satellite).

**Astrometria** - Branca dell'astronomia che studia i moti stellari.

**Attività solare** - Insieme dei fenomeni che caratterizzano la vita del Sole. Si distinguono in macchie solari, protuberanze, brillamenti, vento solare. Raggiungono il massimo di intensità ogni 11 anni, così si parla di ciclo undecennale delle attività solari.

**Aurora polare** - Fenomeno luminoso creato nell'atmosfera dall'interazione di particelle solari ionizzate con il campo magnetico terrestre. Può essere boreale od australe, a seconda dell'emisfero in cui si verifica.

**Azimut** - Distanza angolare fra l'intersezione con l'orizzonte del cerchio verticale passante per l'oggetto osservato ed il polo Nord. Si misura sull'orizzonte, in senso orario, da 0 a 360 gradi a partire dal polo Nord.

**Binaria** - Sistema costituito da due stelle legate dall'attrazione gravitazionale e orbitanti attorno al baricentro. Nell'Universo almeno la metà delle stelle è doppia o multipla. Le stelle binarie si dividono in binarie visuali, astrometriche, spettroscopiche, e a eclisse, mentre le binarie ottiche appaiono doppie solamente per causa prospettica.

**Bolide** - Meteorite che attraversando l'atmosfera terrestre dà vita ad eccezionali fenomeni luminosi ed acustici causati dall'attrito con gli strati atmosferici.

**Calendario** - Suddivisione del tempo basata sul movimento degli astri. Può essere solare, centrato sul moto apparente del Sole, lunare, riferito alle fasi lunari o lunisolare, se si riferisce ad ambedue gli astri.

**Calendario giuliano** - Calendario istituito da Giulio Cesare nel 46 a.C. costituito da 12 mesi per anno, con tre anni di 365 giorni seguiti da uno di 366 giorni. Dato che l'anno medio su 4 anni vale 365,25 giorni, dura oltre 11 minuti più lungo dell'anno tropico, nel XVI secolo venne riformato perché le stagioni non corrispondevano più all'anno civile.

**Calendario gregoriano** - Calendario civile utilizzato in molti paesi e istituito nel 1582 da Papa Gregorio XIII, quando vennero eliminati dieci giorni di calendario. Sono bisestili gli anni divisibili per 4, mentre gli anni di fine secolo sono bisestili solo se divisibili per 400. Dato che l'anno medio su 400 anni vale 365,2425 giorni, questo ha una durata molto simile ai 365,2422 giorni dell'anno tropico.

**Cassini, divisione di** - Separazione fra gli anelli del pianeta Saturno scoperta dall'omonimo astronomo.

**Cerchio di altezza** - Cerchio ottenuto intersecando la sfera celeste con un piano passante per lo zenit e l'osservatore.

**Cerchio massimo** - Intersezione di un piano con una sfera che la taglia in due parti uguali detti emisferi, ed il cui centro è corrispondente a quello della sfera.

**Cerchio meridiano** - Cerchio massimo della sfera celeste passante per i poli celesti Nord e Sud e per i punti detti Zenit e Nadir.

**Cerchio orario** - Cerchio massimo della sfera celeste passante per i poli celesti.

**Cerchio di perpetua apparizione** - Parallelo della sfera celeste che delimita le stelle circumpolari, ossia quelle stelle che in un determinato posto della Terra distano dal polo celeste visibile, attorno a cui ruotano, di una distanza angolare pari o minore alla latitudine del luogo.

**Cerchio di perpetua occultazione** - Analogamente a quello di perpetua apparizione delimita quelle stelle che ruotano ad una distanza pari o inferiore alla latitudine del luogo dal polo celeste invisibile, così da restare permanentemente occultate sotto l'orizzonte.

**Cerchio verticale** - Cerchio massimo della sfera celeste passante per lo zenit ed il nadir. Su di esso viene misurata l'altezza di un astro dall'orizzonte nel sistema di coordinate altazimutali.

**Chioma** - Involucro di gas che circonda il nucleo di una cometa per effetto della radiazione solare.

**Ciclo metonico** - Periodo scoperto da Metone nel V secolo a.C., costituito da 19 anni tropici, dopo i quali le fasi della Luna ricorrono negli stessi giorni dell'anno.

**Circolo polare** - Parallelo della superficie terrestre, distante dall'equatore 66,5 gradi, che delimita la zona polare. Può essere antartico o artico a seconda dell'emisfero cui si riferisce.

**Circumpolari** - Detto di quelle stelle che descrivendo un arco di cerchio completo, attorno al polo visibile e da un determinato posto della Terra, rimangono sempre sopra l'orizzonte ruotando attorno al polo celeste.

**Cluster** - Nome inglese di un Ammasso globulare.

**Coda** - La parte di una cometa espulsa quando questa è vicina al Sole.

**Coluro** - Nome dei cerchi orari passanti per i punti equinoziali e solstiziali.

**Cometa** - Piccolo corpo del sistema solare, orbitante attorno al Sole su un'orbita fortemente eccentrica, che in prossimità del Sole inizia ad evaporare dando vita alla classica coda.

**Congiunzione** - Configurazione planetaria di due o più corpi celesti che hanno più o meno le medesime coordinate astronomiche. Per i pianeti inferiori si distingue in inferiore e superiore.

**Congiunzione inferiore** - Configurazione planetaria di un pianeta inferiore che si trova fra la Terra ed il Sole.

**Congiunzione superiore** - Configurazione planetaria di un pianeta inferiore che si trova oltre il Sole lungo la direzione Terra-Sole-Pianeta.

**Cono d'ombra** - Regione occupata dall'ombra proiettata da un pianeta o un satellite illuminato dal Sole. Se un oggetto passa nel cono d'ombra di un corpo si è in presenza di un'eclissi.

**Contatto** - Fase di un'eclisse dove i bordi dei dischi lunari e solari sembrano apparentemente toccarsi.

**Coordinate astronomiche** - Insieme di valori che permettono l'orientamento lungo la sfera celeste. A seconda del sistema cui si riferiscono abbiamo quelle altazimutali, quelle equatoriali, quelle eclittiche e quelle galattiche.

**Coordinate Celesti (o astronomiche)** - Sistemi di coordinate che descrivono la posizione di un astro sulla sfera celeste. Le principali coordinate utilizzate sono le altazimutali, le equatoriali, le eclittiche e le galattiche.

**Coordinate Eclittiche** - Sistema di coordinate celesti in cui la posizione di un oggetto è definita dalla latitudine eclittica ( $b$ ), misurata in gradi a nord e a sud dell'eclittica, e dalla longitudine eclittica ( $l$ ), misurata in gradi lungo l'eclittica a partire dal punto  $g$ .

**Coordinate equatoriali** - Sistema di coordinate celesti in cui la posizione di un oggetto è definita dalla declinazione ( $\delta$ ), misurata in gradi a nord e a sud dell'equatore celeste, e dall'ascensione retta ( $\alpha$ , A.R.), misurata in ore, minuti e secondi lungo l'equatore celeste a partire dal punto  $g$ . A causa della precessione degli equinozi le coordinate equatoriali sono specifiche per una particolare epoca.

**Coordinate galattiche** - Sistema di coordinate in cui la posizione di un oggetto è definita dalla latitudine, misurata dal piano galattico, e dalla longitudine, misurata in gradi lungo il piano galattico a partire dal centro della Galassia.

**Coordinate geografiche** - Sistema di coordinate in cui la posizione di un punto sulla superficie è individuato dalla latitudine, misurata in gradi a nord e a sud dell'equatore, la longitudine, misurata in gradi est e ovest lungo l'equatore a partire dal meridiano di Greenwich, e l'altitudine, misurata in metri rispetto al livello del mare.

**Corona solare** - La zona più esterna dell'atmosfera solare visibile durante le eclissi totali.

**Costellazioni** - Gruppo di stelle sulla sfera celeste che unite da linee immaginarie formano delle figure. Fin dall'antichità le configurazioni celesti sono state associate a figure mitologiche o di animali, e ben 48 delle odierne costellazioni sono quelle elencate da Tolomeo nel periodo ellenistico. Dal XVII secolo furono proposte altre denominazioni, finché nel 1930 l'Unione Astronomica Internazionale ha definitivamente diviso il cielo in 88 aree, ciascuna della quali corrisponde ad una costellazione. Le stelle più luminose sono denominate con una lettera greca minuscola seguita dal genitivo del nome latino della costellazione.

**Crepuscolo** - Passaggio graduale dal giorno alla notte per effetto dell'atmosfera terrestre che diffonde la luce solare. Si distingue in civile, nautico ed astronomico a seconda che il Sole sia sotto l'orizzonte rispettivamente di 6, 12 o 18 gradi.

**Culminazione** - Rappresenta il passaggio di un corpo celeste al meridiano. Può essere superiore, il punto di minor distanza zenitale, od inferiore, il punto di maggior distanza zenitale. Nelle stelle circumpolari ambedue i punti si trovano sopra l'orizzonte.

**Cuspide** - Una delle due estremità della falce lunare, o di quella di un pianeta inferiore.

**Data giuliana (DG)** - Intervallo di tempo in giorni trascorso dal mezzogiorno dell'1 gennaio 4713 a.C. di Greenwich.

**Declinazione** - Distanza angolare di un corpo dall'equatore celeste. Tracciata sul cerchio orario passante per i poli celesti e l'astro osservato, è compresa fra 0 e 90 gradi e si conta a partire dall'equatore celeste, positivamente verso il polo Nord celeste e negativamente verso quello Sud.

**Deep sky** - Termine con il quale si indicano alcuni oggetti celesti: ammassi stellari, galassie, nebulose.

**Dicotomia** - Aspetto di un corpo celeste illuminato per metà durante le fasi parziali.

**Disco apparente** - Diametro apparente del Sole e della Luna che a causa delle loro diverse distanze sembra avere le medesime dimensioni.

**Diretto** - Direzione del moto celeste di un pianeta da Ovest verso Est, od anche in senso antiorario, se osservato dal Nord dell'eclittica.

**Distanza Angolare** - Lunghezza di un arco espressa in radianti o gradi, corrispondente alla misura dell'angolo fra le linee immaginarie che congiungono l'osservatore con i due estremi dell'arco.

**Doppie, stelle** - Stelle ruotanti attorno ad un comune centro di massa per effetto di reciproci vincoli gravitazionali.

**Draconico** - Periodo di tempo riferito ai nodi lunari, detti dagli antichi testa e coda del drago che mangiava il Sole durante le eclissi.

**Eccentricità** - Elemento orbitale dell'orbita di un corpo celeste pari al rapporto fra il semiasse maggiore e la distanza di un fuoco dal centro dell'orbita. Può essere uguale a 0 (circolare), ad 1 (parabolica) o compresa fra questi due valori (ellittica).

**Eclisse** - Fenomeno astronomico in cui la luce di un corpo celeste è temporaneamente oscurata a causa del passaggio nel cono d'ombra di un altro astro. Nella eclisse di Luna il nostro satellite attraversa il cono d'ombra della Terra e non riceve più la luce del Sole, nella eclissi di Sole la Luna proietta il suo cono d'ombra sulla Terra. Poiché l'orbita lunare è inclinata sul piano dell'orbita terrestre, si ha una eclissi soltanto quando la Luna si trova vicino ai suoi nodi: ogni anno non si verificano più di sette eclissi e ci sono almeno due eclissi solari.

**Eclisse anulare** - Eclissi di Sole in cui il disco lunare non riesce ad ostruire completamente quello solare lasciandone visibile una parte a forma di anello.

**Eclisse Lunare** - Una eclisse di Luna si verifica al plenilunio quando la Luna passa nell'ombra della Terra. Il nostro satellite non compare del tutto, ma assume una luce rossastra a causa della luce riflessa dall'atmosfera terrestre.

**Eclisse parziale** - Tipo di eclisse, solare o lunare, nella quale i dischi dei rispettivi corpi celesti sono interessati dal fenomeno solo parzialmente.

**Eclissi Solare** - Una eclisse di Sole si verifica al novilunio quando la Luna passa davanti al disco solare. Quando il diametro apparente della Luna è minore di quello del Sole l'eclisse è detta anulare. L'ombra proiettata dalla Luna è larga qualche centinaio di chilometri e si muove sulla superficie terrestre: la fase di totalità può durare al massimo 7 minuti e 40 secondi e in tutta la regione circostante si vede un'eclisse parziale.

**Eclisse totale** - Tipo di eclisse che interessa integralmente i dischi lunari e solari.

**Eclittica** - Fascia del cielo lungo la quale si muove apparentemente il Sole. Il nome significa cerchio delle eclissi, in quanto affinché possa verificarsi una di queste, è necessario che la Luna sia in prossimità di quei punti chiamati nodi che sono le intersezioni del suo piano orbitale con l'eclittica. E' anche il piano disegnato dall'orbita della Terra, nel suo moto di rivoluzione attorno al Sole, che è inclinato rispetto all'equatore celeste di 23,5 gradi.

**Eclittiche, coordinate** - Sistema di coordinate che come riferimento si basa sul piano dell'eclittica. Le sue componenti sono la longitudine eclittica e la latitudine eclittica.

**Effemeridi** - Raccolta di dati astronomici che sulla base delle coordinate astronomiche permettono di risalire alla posizione dei corpi celesti.

**Elementi orbitali** - Parametri che determinano il moto e la posizione nel sistema solare di un corpo celeste e della sua orbita. Sono: l'eccentricità, il semiasse maggiore, l'inclinazione, la distanza e la longitudine del perielio dal nodo ed il passaggio al perielio.

**Elongazione** - Distanza angolare vista dalla Terra tra il Sole e un pianeta. Valori particolari di elongazione sono la congiunzione (0°), la quadratura (90°) e l'opposizione (180°).

**Emersione** - Successiva apparizione di un corpo celeste, da dietro il disco di un altro, o dell'ombra di questo, durante il fenomeno delle occultazioni o delle eclissi.

**Emisfero** - Parti uguali di una sfera tagliata in due da un piano equatoriale. Quelli terrestri si indicano come emisferi boreale (settentrionale) ed australe (meridionale).

**Epatta** - Numero di giorni che separano la prima Luna Nuova dell'anno dal primo di Gennaio. Grazie ad un calcolo ad esso legato si ottiene la data della Pasqua.

**Epoca** - Riferimento temporale di validità, per cui sono state calcolate le effemeridi di un dato corpo celeste, al fine di correggere l'errore derivante dal fenomeno della precessione degli equinozi.

**Equatore** - Intersezione di un piano perpendicolare all'asse di una sfera con la superficie della stessa, che la taglia diametralmente in due parti uguali.

**Equatore celeste** - Prolungamento di quello terrestre è quel cerchio massimo che essendo perpendicolare all'asse di rotazione taglia la sfera celeste in due emisferi uguali.

**Equatore terrestre** - Cerchio massimo di latitudine 0 gradi che taglia la Terra in due emisferi.

**Equazione delle effemeridi** - Differenza fra il tempo siderale e quello siderale medio.

**Equazione del tempo** - Differenza fra il tempo solare e quello solare medio.

**Equatoriali, coordinate** - Sistema di coordinate astronomiche basate sull'equatore celeste e sull'asse di rotazione del cielo. Le sue componenti sono l'ascensione retta e la declinazione.

**Equinozi** - Punti dell'orbita terrestre che segnano l'inizio della primavera e dell'autunno e nei quali la durata del giorno è uguale a quella della notte. Rappresentano inoltre le intersezioni dell'equatore

celeste con l'eclittica e sono anche chiamati nodo discendente e nodo ascendente o anche rispettivamente punto della Bilancia e punto d'Ariete. La linea che congiunge i suddetti punti è detta linea degli equinozi e ruota per effetto della precessione degli equinozi.

**Evezione** - Perturbazione causata nel moto della Luna dalla variazione nella spinta gravitazionale del Sole.

**Fasi** - Variazione della porzione illuminata del disco lunare (o di quello dei due pianeti inferiori) per effetto dei rispettivi moti orbitali.

**Fuga, velocità di** - Velocità necessaria a sfuggire all'attrazione gravitazionale di qualsiasi corpo celeste.

**Galassie** - Insieme di stelle, gas e polvere interstellare. Hanno forme diverse: di disco a spirale, ellittiche o irregolari. Furono classificate in passato da E.Hubble che studiandole scoprì anche la legge che porta il suo nome e che dimostra, basandosi sulla reciproca velocità di allontanamento delle galassie, come l'universo sia in perenne espansione. Le galassie hanno la caratteristica di aggregarsi in ammassi e superammassi.

**Galattiche, coordinate** - Sistema di coordinate astronomiche relative alla galassia le cui componenti sono la longitudine e la latitudine galattiche. Il piano di riferimento è quello equatoriale della galassia.

**Galileiani, satelliti** - Le 4 lune maggiori del pianeta Giove, scoperte da G.Galilei.

**Geocentrico** - Sistema di riferimento relativo alla Terra.

**Giorno** - Durata media del periodo di rotazione della Terra attorno al proprio asse.

**Giorno lunare** - Intervallo di tempo fra due successivi passaggi della Luna al meridiano.

**Giorno solare** - Intervallo di tempo fra due successivi passaggi del Sole al meridiano.

**Giorno siderale** - Intervallo di tempo fra due successivi passaggi di una stella per il meridiano. E' piu' breve del giorno solare di circa 4 minuti per effetto del moto orbitale della Terra attorno al Sole.

**Giorno giuliano** - Unità di misura del calendario omonimo che conta i giorni, in modo progressivo, a partire dal 1 gennaio del 4713 A.C.

**Greenwich, meridiano di** - Circolo della sfera terrestre di longitudine 0°.

**Immersione** - Inizio della occultazione di un corpo celeste da parte di un altro.

**Inclinazione** - Distanza angolare fra l'equatore di un corpo celeste ed il suo piano orbitale.

**Inclinazione orbitale** - Elemento orbitale di un corpo del sistema solare che misura la differenza angolare fra il suo piano orbitale e quello dell'eclittica.

**Index Catalogue (IC)** - Catalogo di oggetti non stellari compilato e pubblicato da J.L.E.Dreyer nel 1895 (IC 1) e nel 1908 (IC 2) e contenente circa 5.000 nuovi oggetti che si aggiungono a quelli indicati nel New General Catalogue (NGC).

**Inferiore** - Pianeta la cui orbita attorno al Sole è contenuta entro quella della Terra.

**Latitudine** - Distanza angolare, positiva o negativa, di un punto da un piano equatoriale di riferimento (terrestre, celeste, eclittico, galattico).

**Latitudine eclittica** - Distanza angolare, positiva o negativa, di un punto situato a Nord od a Sud del piano dell'eclittica.

**Latitudine galattica** - Distanza angolare di un punto posto a Nord od a Sud del piano galattico.

**Levare eliaco** - Prima apparizione di una stella ad oriente dopo la congiunzione con il Sole.

**Librazione lunare** - Oscillazione della Luna che permette di vedere fino al 10 % in piu' della superficie rivolta verso la Terra. Opera sia in latitudine che in longitudine.

**Limbo** - Bordo estremo del disco apparente di un corpo celeste.

**Longitudine** - Distanza angolare, positiva o negativa, di un punto della superficie terrestre dal meridiano di Greenwich. Può essere orientale od occidentale. In generale, distanza angolare di un punto da un cerchio massimo di riferimento.

**Longitudine del perielio** - Somma dell'argomento del perielio e della longitudine del nodo ascendente dell'orbita.

**Longitudine del nodo ascendente** - Angolo compreso fra il punto d'Ariete e l'intersezione del piano orbitale con l'eclittica.

**Longitudine eclittica** - Distanza angolare di un punto del piano dell'eclittica dal punto d'ariete.

**Longitudine galattica** - Distanza angolare di un punto del piano galattico dal punto di centro galattico.

**Luce cinerea** - Debole illuminazione del disco lunare, durante le fasi crescenti o calanti, da parte della luce solare riflessa dalla Terra verso la Luna.

**Luce zodiacale** - Fenomeno luminoso creato per diffusione della luce solare da parte di particelle di materia giacenti sul piano dell'eclittica.

**Lunazione** - Periodo di tempo compreso fra due fasi lunari uguali la cui durata è di circa 29,5 giorni. E' detta anche mese sinodico.

**M** - Riferita al catalogo Messier e sguita da un numero d'ordine (es. M32) riporta l'oggetto relativo che ha quel numero d'ordine nel catalogo (nell'esempio precedente, la galassia di Andromeda).

**Magnitudine** - Misura della luminosità dei corpi celesti. Data la differente distanza che ci separa dalle stelle essa si distingue in apparente, quella che appare nel cielo, ed in assoluta che corrisponde alla luminosità effettiva osservata dalla distanza di 10 parsec. Viene divisa in classi decrescenti con una differenza fra le piu' luminose e le meno luminose di circa 500 volte.

**Meccanica celeste** - Branca dell'astronomia avente come studio la dinamica dei movimenti degli astri posti sotto l'effetto di campi gravitazionali.

**Megaparsec** - Unità di misura delle distanze galattiche e cosmologiche, pari a 1 milione di parsec.

**Meridiano** - Cerchio massimo della sfera celeste passante per i poli celesti, lo zenit ed il nadir di una data località terrestre.

**Mese anomalistico** - Periodo di tempo fra due successivi passaggi della Luna all'apogeo od al perigeo. E' uguale a 27,6 giorni.

**Mese draconico** - Intervallo di tempo fra due successivi passaggi della Luna allo stesso nodo. E' uguale a 27,2 giorni.

**Mese siderale** - Durata del periodo di rivoluzione della Luna attorno alla Terra. Durata 27,3 giorni.

**Mese sinodico** - Periodo di tempo fra due fasi lunari uguali. E' uguale a 29,5 giorni.

**Meteora (stella cadente)** - Raggio di luce causato da un meteorioide che si consuma per attrito con gli strati atmosferici.

**Meteorite** - Meteorioide, che attraversando l'atmosfera terrestre, resiste all'attrito con essa per via delle sue grandi dimensioni, riuscendo così a raggiungere la superficie e causando un impatto con essa.

**Meteorioide** - Corpo roccioso vagante nel sistema solare.

**Mezzanotte** - Culminazione inferiore del Sole.

**Mezzocielo** - Punto di intersezione fra il meridiano del luogo e l'equatore celeste.

**Mezzogiorno** - Culminazione superiore del Sole.

**Moto diurno** - Rotazione apparente della sfera celeste, da Est ad Ovest, dovuto al moto rotatorio della



Terra attorno al proprio asse nella direzione contraria.

**Moto planetario** - Moto apparente dei pianeti nel cielo (od orbitale nel sistema solare). Si distingue in retrogrado, se avviene da oriente verso occidente (od in senso orario, se visto dal Nord dell'eclittica), ed in diretto (antiorario) nella direzione contraria.

**Nadir** - Punto di intersezione inferiore della verticale del luogo con la sfera celeste. E' l'opposto dello Zenit.

**Nebulosa** - Nube di gas e polvere interstellare che può essere oscura, se assorbe la luce di una stella impedendone la visuale, o luminosa, se riflette (nebulosa a riflessione) o viene ionizzata (nebulosa ad emissione) dalla luce di stelle vicine.

**Nebulosa planetaria** - Gas emessi, sotto forma di anello in rapida espansione, dagli strati esterni di una stella nelle sue ultime fasi di vita.

**Nodo** - Generalmente indica l'intersezione di un'orbita con il piano dell'eclittica. Può essere ascendente o discendente.

**Numero d'oro** - Numero d'ordine, compreso fra 1 e 19, che indicava ognuno degli anni nell'ambito del ciclo di Metone.

**Nutazione** - Movimento oscillatorio dell'asse del pianeta Terra. E' causato dal fatto che l'attrazione gravitazionale della Luna e del Sole sul rigonfiamento equatoriale terrestre varia nel tempo a seconda delle loro posizioni relative. Per l'effetto congiunto della nutazione e di un'altra perturbazione di ampiezza maggiore (la precessione), l'asse di rotazione terrestre compie un moto sinuoso nel cielo, anziché mantenere una direzione fissa nello spazio.

**Occultazione** - Fenomeno astronomico che si verifica allorché un corpo celeste passando davanti ad un altro ne oscura la sua visuale nel cielo.

**Opposizione** - Configurazione planetaria di un corpo del sistema solare che dista dal Sole, rispetto alla Terra, di un angolo di 180° o di 12 ore in ascensione retta.

**Orarie, stelle** - Stelle che descrivono nel cielo un arco di cerchio per metà sopra l'orizzonte e per l'altra sotto di esso.

**Orbita** - Traiettoria di un corpo celeste che ruota attorno ad un altro per via della forza gravitazionale. Generalmente è di forma ellittica.

**Orizzonte** - Intersezione del piano tangente al luogo d'osservazione con la sfera celeste.

**Parallasse** - Apparente spostamento angolare di una stella. Può essere annua, se riferita al moto di rivoluzione della Terra attorno al Sole, o diurna se riferita al moto di rotazione terrestre. Da essa si risale alla distanza astronomica di un corpo celeste.

**Parallelo** - Circolo paralleli all'equatore terrestre sui quali viene misurata la longitudine.

**Parsec** - Unità di misura delle distanze interstellari, equivalente a circa 3 anni luce, che corrispondono ad uno spostamento angolare nel cielo di un primo d'arco da parte di una stella che viene osservata da due punti distanti fra loro una unità astronomica (dist. media fra Sole e Terra).

**Passaggio al perielio** - Istante del transito di ogni corpo del sistema solare per il punto più prossimo al Sole.

**Periastro** - Punto dell'orbita ellittica di una stella binaria di minor distanza dal fuoco.

**Perigeo** - Punto dell'orbita della Luna, o di un satellite artificiale, di minima distanza dalla Terra.

**Perielio** - Punto dell'orbita di un corpo del sistema solare di minima distanza dal Sole.

**Periodo orbitale** - Intervallo di tempo impiegato da un corpo celeste a descrivere una rivoluzione completa.

**Periodo siderale** - Intervallo di tempo compreso fra due successivi passaggi di un corpo celeste per lo stesso punto della sua orbita.

**Periselenio** - Punto dell'orbita di un corpo celeste più vicino alla Luna.

**Perturbazioni** - Variazioni dell'orbita di un corpo celeste causate da passaggi ravvicinati a grandi masse che con la loro forza gravitazionale ne sconvolgono gli elementi orbitali.

**Pianeta** - Corpo celeste orbitante attorno al Sole, caratterizzato da grandi dimensioni e dalla mancanza di emissione di energia.

**Pianeti esterni** - Marte, Giove, Saturno, Urano, Nettuno e Plutone sono i pianeti esterni all'orbita terrestre.

**Pianeti interni** - Mercurio e Venere sono i pianeti interni all'orbita della Terra.

**Pianetini** - Piccoli corpi del sistema solare caratterizzati dalle dimensioni e dalle orbite irregolari. Detti anche asteroidi occupano un'orbita fra Marte e Giove che per questo viene detta fascia degli asteroidi.

**Piano orbitale** - Piano descritto dall'orbita di un corpo celeste.

**Planetesimi** - Oggetti rocciosi primordiali, formati per aggregazione di polveri nella nube protosolare, dai quali si pensa si siano formati asteroidi e pianeti per mutua attrazione gravitazionale.

**Polare, stella** - Stella dell'Orsa minore che approssimativamente indica il polo Nord celeste.

**Poli** - In generale, estremità dell'asse di rotazione di ogni corpo celeste.

**Poli celesti** - Punti di intersezione del prolungamento dell'asse terrestre, l'asse celeste, con la sfera celeste.

**Poli terrestri** - Punti di intersezione dell'asse terrestre con la superficie terrestre.

**Precessione degli equinozi** - Oscillazione dell'asse terrestre, per effetto della forza gravitazionale del Sole e della Luna sul nostro pianeta, che conferisce un movimento a forma di trottola all'asse celeste, che descrive così un cerchio in circa 26000 anni. Una sua conseguenza è la variazione di tutti i riferimenti celesti, principalmente degli equinozi, che anticipano ogni anno di circa 20 minuti.

**Punti cardinali** - Intersezioni del meridiano e dell'equatore celeste con l'orizzonte, che in tal modo generano i 4 punti cardinali: Nord, Sud, Est ed Ovest.

**Quadratura** - Configurazione di un corpo celeste che dalla Terra viene visto ad una distanza angolare di 90 gradi dal Sole.

**Raggio vettore** - Linea congiungente il Sole con la posizione di un pianeta lungo la sua orbita.

**Radiante** - Punto apparente del cielo dal quale sembrano provenire le meteore durante una pioggia di stelle cadenti.

**Retrogradazione** - Particolare spostamento apparente di un pianeta rispetto alla Terra durante il quale la longitudine geocentrica decresce. La retrogradazione è un effetto ottico dovuto ai movimenti della Terra e del pianeta considerato attorno al Sole; accade così che durante la sua normale orbita apparente, il pianeta rallenti, si fermi e poi torni indietro rispetto alle stelle fisse. In seguito rallenterà di nuovo e tornerà a seguire il percorso originario, compiendo una specie di asola tra le stelle.

**Retrogrado** - Direzione del moto celeste di un pianeta da Est verso Ovest, od anche in senso orario, se osservato dal Nord dell'eclittica.

**Rivoluzione** - Moto orbitale di uno o più corpi attorno ad un centro di massa.

**Rotazione** - Moto rotatorio di un corpo celeste attorno ad un asse.

**Saros, ciclo di** - Periodo di tempo uguale a 18 anni 10 giorni ed 8 ore dopo il quale le eclissi solari e

lunari si ripetono alle medesime condizioni.

**Satellite** - In genere ogni corpo minore che orbita attorno ad un altro di dimensioni molto maggiori. Nel caso della Terra possono essere anche artificiali.

**Schiacciamento polare** - Appiattimento delle regioni polari di un pianeta, dovuto alla forza centrifuga derivante dal moto di rotazione. In generale rapporto fra il raggio equatoriale e quello polare.

**Semiasse maggiore** - La metà dell'asse maggiore di ogni orbita ellittica. Si misura in unità astronomiche.

**Sestante** - Strumento astronomico atto alla misurazione dell'altezza sull'orizzonte del Sole o di qualsiasi altro corpo celeste.

**Sfera celeste** - Astrazione geometrica di forma sferica, concentrica alla Terra, sulla quale appaiono proiettati tutti i corpi celesti per effetto prospettico.

**Siderite** - Meteorite costituito quasi completamente da ferro e nickel.

**Sigizie** - Punti dell'orbita lunare dove la Luna, il Sole e la Terra sono allineati.

**Solstizi** - Punti dell'eclittica, e corrispondentemente della sfera celeste, dove il Sole raggiunge la massima e minima declinazione del suo percorso annuale apparente. Relativi alle stagioni sono detti solstizio d'inverno e solstizio d'estate.

**Stagioni** - Intervallo di tempo impiegato dalla Terra per passare da un punto equinoziale ad uno solstiziale e viceversa.

**Stelle orarie** - Stelle delle quali si conosce con esattezza la posizione celeste, ed usate per la determinazione del tempo siderale.

**Superiore** - Pianeta la cui orbita è dislocata al di là di quella terrestre.

**Tempo solare** - Misurazione del tempo basata sul moto diurno ed annuale del Sole nel cielo, e conseguentemente sui moti del pianeta Terra. L'unità di misura è il secondo, sottomultiplo del giorno che è pari a circa 24 ore.

**Tempo siderale** - Misurazione del tempo basato sull'intervallo di tempo compreso fra due successivi passaggi di una stella al meridiano. Inferiore a quello solare, è pari a 23 ore e 56 minuti.

**Tempo universale** - Tempo locale del meridiano di Greenwich di longitudine 0°.

**Terminatore** - Linea di separazione fra l'emisfero illuminato e quello buio di un corpo celeste.

**Transito** - Passaggio di un corpo celeste al meridiano o davanti al disco di un altro corpo di dimensioni maggiori.

**Troiano** - Aggettivo riferito a un asteroide appartenente alla famiglia dei Troiani (vedi Lagrange, punti di).

**Tropici** - Paralleli delle coordinate geografiche terrestri distanti dall'equatore +23.5 gradi, quello del Cancro, e -23,5 gradi quello del Capricorno. Sono chiamati con i rispettivi nomi delle costellazioni sulle quali appariva proiettato il Sole nell'antichità, ai rispettivi solstizi d'estate e d'inverno, cui ora non corrispondono più per effetto della precessione degli equinozi.

**UA , Ua, Unità astronomica** - Distanza media della Terra dal Sole. E' pari a 149,6 milioni di km.

**Universale, tempo (T.U.)** - Corrispondente al tempo medio di Greenwich.

**Variabili, stelle** - Stelle che variano la propria luminosità in funzione di caratteristiche geometriche (eclissi) o fisiche (alternanza di espansioni e contrazioni).

**Velocità radiale** - Misura della velocità in relazione alla direzione di osservazione.

**Via Lattea** - Fascia celeste lattiginosa creata dal piano equatoriale della nostra galassia.

**Zenit** - Intersezione della verticale del luogo con la volta celeste.

**Zodiaco** - Settore celeste, concentrico all'eclittica, e suddiviso in dodici segni zodiacali di 30 gradi ciascuno. Rappresenta l'insieme delle 12 costellazioni che il Sole attraversa durante il suo ciclo annuale. A causa della precessione degli equinozi le costellazioni che originariamente occupavano un segno sono attualmente spostate in quello a fianco, anche se per convenzione gli astronomi hanno sinora mantenuto la disposizione iniziale dei segni zodiacali.

**Zodiacale, luce** - Luminosità dovuta a nubi di polvere interplanetaria, che illuminata dalla luce solare è vista all'alba od al tramonto in direzione dell'eclittica essendo appunto situata lungo il suo piano.

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- (1) ICE - Interactive computer ephemeris
- (2) [www.sym454.org](http://www.sym454.org)
- (3) Planets visibility, Alcyone software, freeware
- (4) Alcyone ephemeris
- (5) Ephemeris tools, <http://virtualskysoft.de>
- (6) Solex, A.Vitagliano
- (7) <http://www.iota-es.de/>
- (8) Win Occult
- (9) Minor Planets software, S.Foglia
- (10) <http://www.aerith.net>
- (11) Accurate times

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